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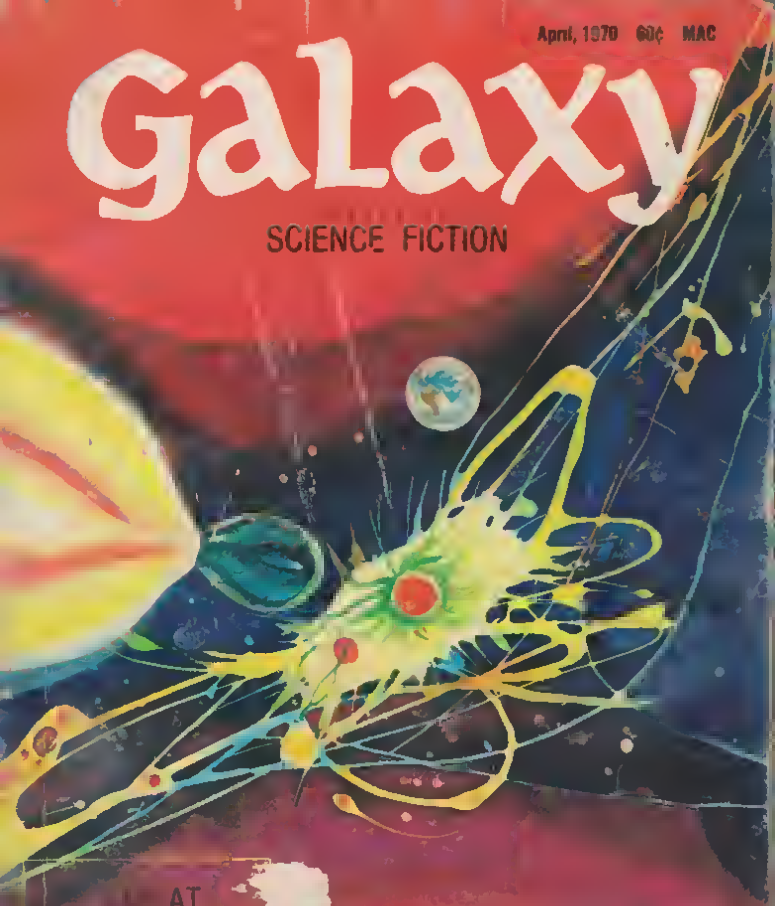

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Allison,
Carmichael
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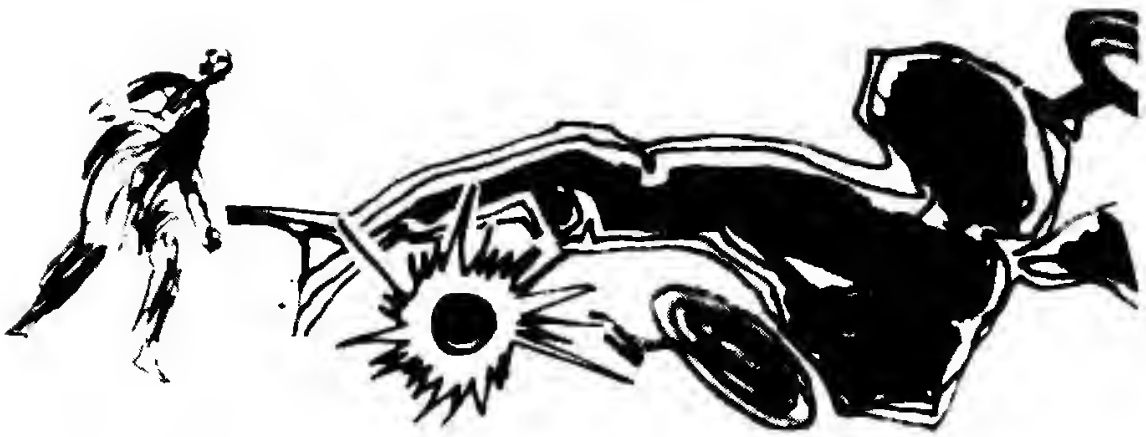

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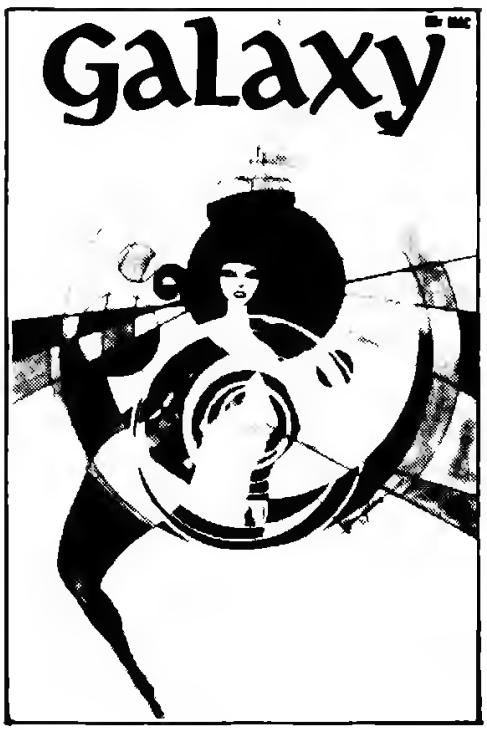

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Cover by GAUGHAN, suggested by ALLISON, CARMICHAEL AND TATTERSALL

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ON GENETICS AND CONSENSUS

SOMETIMES I get the feeling that I'm surrounded by a hideous reality arrived at by what is known as Consensus. A believer is the guy who looks at the sunset and tells you that it's as beautiful as a post card. One day he will meet a girl who is as pretty as a picture (don't let this get past you), for whom he will vaguely evoke model males touted in mass media. These two will marry and breed children who will start life looking like all their cousins and other relatives on both sides but will grow up to be just like the old man or the old lady.

And keep the faith.

Some day the jerk will die either to confirm an accident or a medical statistic—or simply of never having lived or seen a sunset or known a woman or had anything but hand-me-down children.

In his coffin he will look natural and lifelike for the first time since birth. Forgettable phrases will eulogize him—as pertinent to him as a post card is to a sunset or a picture to a lovely girl, for he was, after all, human. But the one unforgettable truth about him will not be uttered.

He lived by—and died for—Consensus.

Some of us do. Others don't. Some of us will see a sunset as a sunset, a woman as a woman, a man as a man and a child as something new—a genetic combination as individual as a fingerprint. An unprecedented life form about which no Consensus can exist, human genetics being as helter-skelter as they are.

Ostensibly, by consensus, we breed by skin color, common antecedents, religious or ethnic dogma, for money or status and sometimes just for kicks. The historic realities of human procreation, of course—and I think fortunately—have little to do with such irrelevancies.

You and I—if you're truly reading this—come from a long line of people and who knows what before that. We have this in common and I will say nothing more about your people. But if anyone were to tell me that over the millennia not one of mine crossed a frontier or jumped a fence I would know I was dealing with a clown. Or perhaps an idiot.

I would know so from personal history, immediate family history and the recorded movements of more distant ancestors during the great churnings of Earth's human populations—mass migrations attended by violence, rapine, ravishment, conquest, love and lust. I come from restless, pagan stock and even a brief glance at a schematic diagram of the races of man would suggest that we are genetically related right around the globe.

Regardless of race, color or creed. And this, right now, is where the action is.

The Tower of Glass a great new serial by Robert Silverberg, starts in this issue. It deals with man's mastery of his own creation and genes. It also touches on the false gods of Consensus and is a book that makes science fiction not only pertinent but necessary.

Enjoy it. —JAKOBSSON

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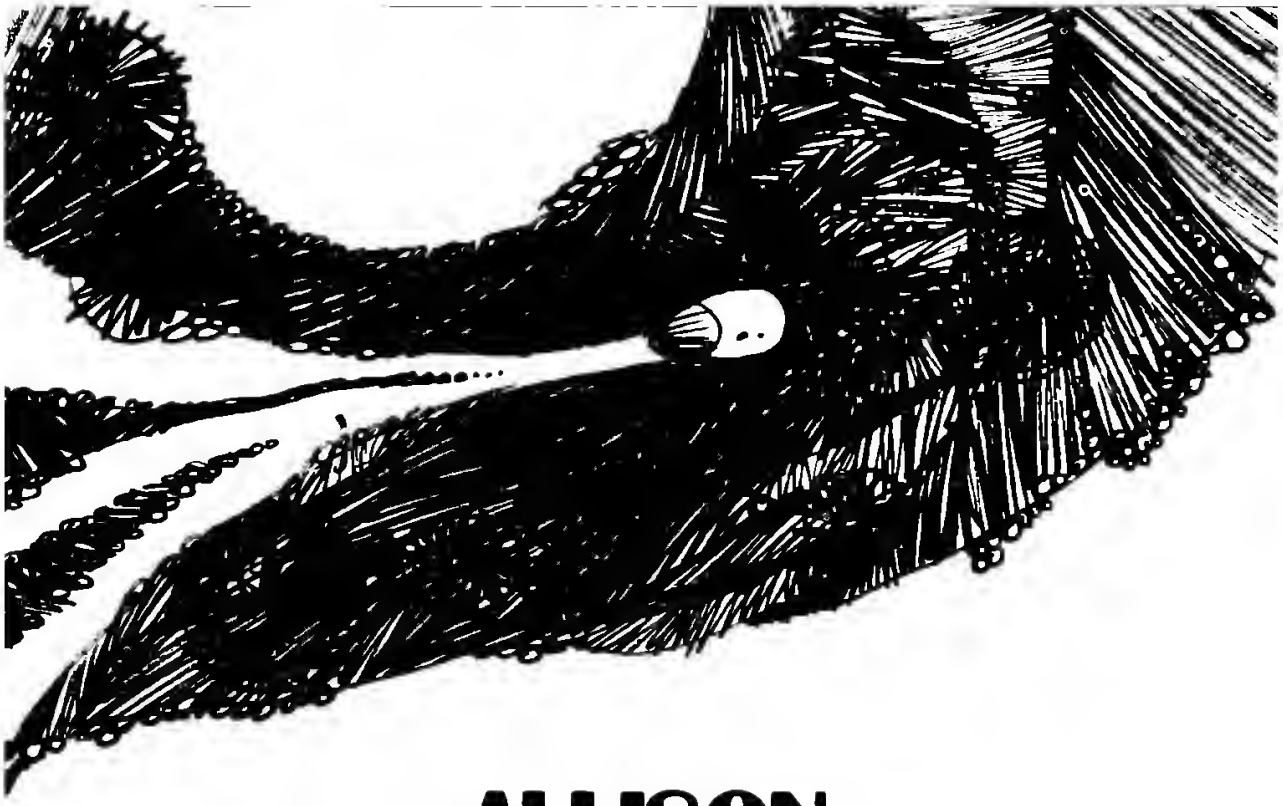

ALLISON, CARMICHAEL and TATTERSALL

Space history echoes with their achievements. If you haven't yet read about them—start now!

STEPHEN TALL

THEY were all of them weird, by proper standards: Allison, Carmichael and Tattersall. Oddballs. Starry-eyed nuts. The space program was the space program but you didn't have to leave the human race to be a part of it. So said their contemporaries, with sly and good-humored scorn.

How could they know that in the long list of special names in the history of space contemplation and exploration, names like Aristotle, Galileo, Einstein, Goddard, Shepherd, Lovell, Armstrong, Aldrin—none would be more lustrous, more worthy of memory than Allison, Carmichael and Tattersall?

Since the moon explorations, man had reached out. Mars was known. Four landings had been made on its bare and cratered crust and the hope of finding indigenous life and remnants of past civilizations had been sponged away by bleak fact. There was no life on Mars. Apparently there had never been. But it, too, had served. Timonium power was first used on the Mars run—and the solar system opened. The stars still lay beyond. But an infant must learn to walk one step at a time. The next step, vast Jupiter, swung in its majestic orbit as always and now, with timonium, it was within reach.

The target was Callisto.

It had long been theorized that the giant planet might never be explored at first hand but that its big inner satellites were natural space stations, ready-built observatories for the studies that would have to be made before improving man moved on to the stars, out into the unknown systems that swung around other suns.

The term was Callistonaut. There were to be three of them; three men intelligent enough to grasp the intricate technologies that would implement the entire project. Three men who could live together tranquilly and at peace for the two years of the journey to Jupiter's great moon and return. Three men with competencies so special that location meant nothing to them. Three men who could work for days and weeks without thinking of their surroundings at all. Three men who could live happily without the human race.

And when the tests and competitions and complex analyses and expert opinions were finally structured and programed and fed into the computers the three Callistonauts, by margins so wide that it was no contest, were Allison, Carmichael and Tattersall.

Allison and Carmichael could play tick-tack-toe for literally days on end. They had a record of games that extended back to the first days of their space academy training. They had refined the game and complicated it but it was still tick-tack-toe.

Tattersall loved to watch ants. He could and did watch them from earliest dawn until they grew quiet

in the evening chill. He was happiest when he had a day all to himself, a day in which he could watch ants.

It must not be inferred that these things were all they could do. Naturally not. Carmichael was a space physicist-mathematician of such profundity that he thought—and sometimes spoke—in mathematical symbols. And his memory was legendary. Allison had designed the basic energy-detection devices with which the spaceship was equipped. He expected to work on them, to extend them, to test them, to use them for whatever purposes presented themselves during the two-year voyage.

Tattersall's concern was life. All kinds of life. Life interacting with life, life in whatever forms it could be imagined to exist and wherever it might possibly be found. Was there life on Jupiter? On Callisto? If there was, Allison would detect it, Tattersall would recognize and interpret it and Carmichael would reduce everything to formulae of unimaginable complexity and completeness and collaborate with the computers in deciding what they meant.

IN THE orbiting assembly factory stabilized thirty-one hundred miles above the Colorado Rockies the Callisto ship finally reached completion. Its interior, designed by the best minds in the international space program, was modified slightly by its occupants-to-be to include a comfortable game cubicle where tick-tack-toe, space chess and other games could be played. Adequate provision also was made for the housing of Tattersall's ant colonies, a number of which he planned to take along. The long artificial days, the weeks and months in deep space, would be ideal for ant-watching.

The ship had little personality. It was a metallic, glittering, featureless teardrop, the blunt end destined to nose first into uncharted, uninvaded space, the tapered trailing end well suited for the extruding of sensors, and for the location of ion exhausts from the strange new timonium engines. On one side of the front bulge was painted the insignia banner of the International Space Council, on the other glowed the Stars and Stripes. The Callistonauts approved of these. They were proper and fitting. But the name *Natalie* across the front of the ship's blunt snout annoyed them all.

"That is ridiculous," Allison said. "Whose bright idea was that? Naming the ship is the spaceman's right. I wouldn't be comfortable invading deep space in a ship called *Natalie*. I don't even know a Natalie."

He had not been informed that Natalie was the name of the International Space Council President's favorite niece. It would have made no difference if he had known.

Tattersall strode on long legs around the front of the vessel, his magnetized boots snapping onto the metallic scaffolding at each step. He liked the lines of the teardrop.

"This is a good craft," said Tattersall. "She has a destiny. She will ride the oceans of space. She'll be blown along by the solar winds. Let's call her the *Albatross*."

"I used to be pretty good with a brush," Carmichael said. "Probably I haven't lost my touch."

So he called a construction foreman, borrowed the equipment he needed and had himself lifted up to where he could go to work. A few minutes with an expunger, and *Natalie* was no more. Then neatly, in Old English lettering, he painted *Albatross* in glittering blue.

"Put a penetrator ray on that," he directed the workman. "Make it a part of the hull. If Natalie has to have her name on something, we'll call a mountain on Callisto Natalie."

"One on the back side," Allison amended.

Like Earth's moon, Callisto always keeps the same side toward its planet.

The Callistonauts thought nothing of this tweaking of the nose of Authority. In fact, they thought very little of Authority, period. As the first spacemen destined to pass the asteroid belt, to probe the far reaches of emptiness in which swung the Outer Planets, they knew they were special and thus entitled to a reasonable amount of privilege. This they were not backward about assuming. The prompt handling of the name incident set the tone for the entire operation. ISC could finance, construct, plan and propose but when the chips were down it would be the Callistonauts, the men on the spot, Allison, Carmichael and Tattersall, who would dispose.

So no more was heard of Natalie. The *Albatross* was christened by breaking on its snout a bottle containing French champagne, Russian vodka, Japanese saki, Mexican tequila, Scotch whiskey and, at Tattersall's insistence, a small dollop of good bourbon from a little still known to him in the Tennessee hills. Four hundred million television sets showed the ceremony to the world, while announcers and commentators chattered in five hundred languages, plus any number of dialects and accents. The composite fluid from the broken bottle had no effect on the ship's hull, thus confirming a general impression. The *Albatross* was a sturdy craft.

There was a great deal of oratory. Dignitaries from all the countries that had contributed to any extent to ISC were ferried up from the planet's surface and occupied seats of honor on the great domed platform, looking down on the green and cloud-swathed Earth and out into the blue-black void of

space. If they had contributed sizable amounts, they were on the program. The speeches went on for hours. They might have lasted longer had not the Callistonauts, growing bored, gotten up and walked out of the dome, crossed along the pressurized corridor and boarded the ship.

"A man can take just so much," Allison commented. "After all that hot air, they'll have to pump out the bubble."

"Live and let live," said Carmichael generously. "They're having fun. If they hadn't seen us walk out, they'd never have missed us."

"Pity," Allison said. "Still, I suppose we might sneak in a game or so while they're winding things up. We can say we're christening the game room."

They settled in, made themselves comfortable, and soon were lost in tick-tack-toe. Tattersall went to see about his ants.

THE pre-launch activities came to an end at last. The Callistonauts went through the final checklist of seven thousand four hundred and two items with Earth Control, Allison and Tattersall using conventional lists, Carmichael doing the whole thing in his head. Then they posed for final pictures, battened the last hatch and the *Albatross* pushed gently away from the domes and platform and scaffolding of her orbiting birthplace and floated quietly, a mile or so from the crowded platform of watching VIPs. The crew strapped and fitted into their acceleration couches. Ignition lights burned. There was a soft whine, a faint blue mist diffusing at the tail of the teardrop, and then, to the wide-eyed watchers, nothing. The *Albatross* was in her element, riding the solar winds.

"There's not much point in piling up all those Gs at take-off," Carmichael remarked ten minutes later, as they unstrapped. "We could build speed slowly and get the same result."

"Makes your tummy unhappy, does it?" Tattersall grinned. He bounced his lanky form from one wall to the other of the observation-control room, finally steadied himself in midair but upside-down to his two companions, who still clung to their couches.

"Not really," Carmichael said, "though I've got more tummy to be unhappy than either of you." Carmichael was short, had a pink face and platinum hair and tended to be plump. "It's just that the fast take-off is an atavism. Like having a buggy-whip socket on a racing car."

"We can put that in the report," Allison suggested. "It's true enough and it's a good line." He rolled off his couch and floated free in the zero gravity.

They all spent a few minutes bounding about, enjoying weight-

lessness. They handled the situation expertly, for each had had several moon runs and Allison had been a member of the last Mars expedition. They had their space legs. But probably what they were enjoying most was the knowledge that the wordy VIPs were receding into the distance at a comfortable fifty thousand miles an hour.

"Well, to work," Carmichael said. "Let's check out with Earth Control and verify what they know as well as we do. Once they're happy we can have a bite of something and then I'll feel we're in business."

"I'll do it," Tattersall offered. "After we pass the moon I've got a watch program to set up. Let me get my routine over first."

So he went through the seven thousand, four hundred and two-item checklist with Earth Control, exchanged a couple of pleasantries and switched off audio contact. Everything green. Everything Go. Earth Control could monitor every system and activity on the craft, could activate back-up systems, could even detect need for and initiate repairs. As far as the responsibilities of the Callistonauts were concerned, the *Albatross* was as completely automatic as any space entity had ever been.

The one thing Earth Control could not monitor without the cooperation of the crew of the *Albatross* was conversation. And that probably was just as well.

Actually the *Albatross* was a luxury situation. Due to the launch from high Earth orbit and the marvelous efficiency of the timonium reactors, there were no practical restrictions on needed equipment, materials or space. The ship's calculated fuel need, for all situations and for two years, was just thirty-one pounds of timonium. And a three hundred per cent margin for unanticipated emergency was included in this.

A two-year supply of food biomass, in forms that each man found most palatable and perfectly maintained in fresh or living condition, was no great problem. In addition, a hydroponics room, which ran itself, provided everything from radishes to melons. And if both of these were, for some highly unlikely reason, no longer available, the ship's organic recycling systems would still feed the Callistonauts. Not as enjoyably—but they would be nourished indefinitely. They wouldn't starve.

Each man had a small but comfortable stateroom. The workshop was the result of an inordinate amount of planning and designing and there was no reasonable equipment that could not be constructed in it. Raw materials were in adequate supply, including projected possible needed amounts of every element in pure form. In short, the Callisto run was more than a simple expedition to explore a sector of the Solar System.

It was preparation and training for the stars.

AFTER ten hours in space the Callistonaunts were not only settled in, they felt more at home than they had felt for months. They had watched the moon drift by at a close four thousand miles and had received a *bon voyage* message from the dome at Tranquillity. They had had a meal, a rest period, and each had taken a first step on an activity that was particularly his own.

Tattersall had gotten his ant colonies properly installed and normally active. In the stress of takeoff he had neglected to activate the rotation of the ant lab and had found each colony capsule an unhappy, leg-waving cloud of ant workers floating about aimlessly in the zero gravity or clinging together in violently agitated balls. There was considerable individual injury. With the establishment of normal one-G, the ants promptly resumed instinctive behavior and no permanent harm resulted from the oversight.

"In any ecosystem, damage to the individual is only a symptom," Tattersall mused as he watched his pets clear away the debris after the disaster. "If the species adjusts, the species persists."

Allison set up the first of a proposed series of screens designed to make visual the sophisticated winnowing of a matter-detecting device. This was simply a variation of his energy-detecting and analyzing principle and he had high hopes for it. Trained on a space quadrat of known size, the sensors were designed to locate and eventually to record each material particle as it appeared in and traversed the area. Since these were of many kinds and values, the first screen showed a confusing kaleidoscope of streaks and clusters of light. But Allison sat and studied it happily.

Carmichael's concern was with the computers. There were three of them and each reinforced and extended the potential of its next smaller predecessor. Hence the first two actually digested and structured data for involved analysis by the third. They required no maintenance or adjustment but Carmichael faced them with problem after problem, all manner of probability speculations, hypotheses in a variety of frames and contexts. In his way he was quite as content as Allison or Tattersall.

They had the second meal together. This was not to be a pattern. None of them had the same metabolism, the same rest needs, the same work-period length preferences. The ship's maintenance was completely automatic. Its speed and guidance was one of the functions of the first computer and never required the collective attention of the Callistonauts. This second meal, therefore, was en-

tirely social, before individual activity rhythms became established.

"Request a conference," Tattersall said, after the eggs and bacon, toast and orange juice.

There was both California and Florida orange juice, to be fair. With the second cup of coffee they were leaning back in their chairs, relaxing. The ship had been given a one-G spin, so normal eating procedure was possible.

"I'm available," Carmichael said, stirring his coffee. As his well-nourished build indicated, he took both sugar and cream. Allison liked cream only, while Tattersall drank his black.

"Fire away," said Allison.

Tattersall sipped tentatively at his steaming cup.

"I'm concerned," he said, "with all that empty space out there."

"Aren't we all?" Carmichael asked.

"A partial misstatement," Allison pointed out. "It's space, of course, but it's not entirely empty. Matter is simply more widely scattered. Everything's relative."

"This we know," Tattersall conceded. "I used conventional phrasing. My concern is this: In every life situation that I'm aware of, each living thing has a minimum space requirement. It also must have a consistent energy source and sufficient matter for a corporeal entity. The availability of these basics results in persistence of life form. No sweat?"

"Ecology I," Carmichael said. "Carry on."

"In any ecosystem," Tattersall lectured, "given the energy and the matter in usable form, the competition is for space. Hence Earth, with its carbon-based life molecules adjusted to a free-oxygen atmosphere and able to aggregate into complex life forms, is limited in population numbers only by the space it can provide."

"Obvious, but relevant to what? This is out of my field," commented Allison.

"I'll get to you," Tattersall said. "I think you're important. But first, more kindergarten. Why isn't there life on Earth's moon? On Mars?"

"Atmosphere, naturally," Allison said. "Lacking that, the other missing basics, if any, make no difference. No oxygen, no life."

"As we know it," Tattersall added. "There's space, though. Just no way to make a usable energy flow available to complex, replicating molecules. Q.E.D."

"So what's the question?" asked Carmichael.

"There could be living entities on Mars, perhaps," went on Tattersall, "if they had other than a carbon-based molecular organization and another way of garnering the needed energy supply. We don't believe they're there, for such 'living things,' if you will, would be likely to approach densities com-

parable to the substrate and would hence be detectable. We could see 'em, weigh 'em, count 'em, take their pictures. And the available space for such forms, the surface space of the planet, would be negligible compared to all this lovely nothing we can see out the view ports. In other words, if life could get its basic requirements of matter and energy in some other fashion, why should it aggregate around any miserable little dense matter complex? Its other need is space. And there's space. Endless, ageless distances of it."

"You're beginning to interest me," Allison said. "Tie it up."

"When I saw my ants tumbling about in zero gravity, totally unable to adjust to the lack of the attraction of their bodies to a dense substrate, I began to think. If there were no large, appreciable aggregations of matter in the universe, would there be no life? If matter and energies are diffuse, are they any less there? That space out there is older than any planet, older than any sun. Why couldn't it also be the oldest life space, the ancestral biosphere?"

Carmichael bounced out of his chair, took quick strides up and down the small dining room.

"Beautiful," he said. "Logical, too. I'll compute some general probabilities, then dig into the likelihood of other living molecular combinations, using known atomic structure, elemental affinities and behavior, for data. It could take me a while."

"We're twelve hours from Earth," Allison pointed out. "We're concerned, among other things, with the possible life on Jupiter, on Callisto, and the rest of the Jovian complex as opportunity offers. Are you trying to reason that life out of existence before we even get there?"

Tattersall grinned.

"Not at all," he said. "You weren't listening. The probabilities are the same as they were before I said a word. And I wasn't saying that the possibilities of life on those aggregates are particularly remote. Carmichael can do some playing with that. I was reasoning after the fact with the moon and Mars. If there's life there, nothing we've yet devised can detect it."

He paused and his long, homely, Lincolnesque face looked blankly into distance.

"No," he continued, "what I'm really concerned with is the space between here and there. Is it waste, non-usable space as far as life is concerned? Since the beginning of time, whatever that means, have no replicating, behaving masses ever made use of all that apparent emptiness? As an ecologist, suddenly I don't believe it."

He eyed Allison's classic profile, so different from his own.

"You've got sensors out," he said. "You're probing that same space with equipment so special I'll

never have sense enough to understand it. Do I challenge you?"

"You know, you do," Allison said. "I'm surveying space because it's full, not because it's empty. You're hypothesizing concerning what it may possibly be full of."

Tattersall unfolded his long form.

"As far as I'm concerned, conference is over," he said. "I've got my money's worth."

II

TATTERSALL knew he'd get his money's worth in more than discussion. The organization, or rather the complete lack of it, of the *Albatross* personnel practically guaranteed that. He had planted an idea. Each Callistonaut had his own competencies, his own special areas of concern. He had no obligatory tasks, no restrictions on how he should or should not spend his time. No man had authority, save over his own activities. It shouldn't have worked, men being men. But it did.

For three activity spans, roughly three Earth days, the men barely noticed each other. Carmichael slept twice, Allison had his eight hours three times, while Tattersall had four brief naps. Carmichael had roast beef, lamb chops, a huge pizza and lots of ice cream during his waking hours, Allison had run heavily to vegetables and eggs and had visited the hydroponics room twice for fresh leafy greens. He also took setting-up exercises after each sleep. Tattersall wasn't hungry, so he knew he must have eaten now and then, but he couldn't remember what.

The spaceship was tooling along at the agreed-on fifty thousand miles an hour. Earth Control monitored but made no adjustments, since none were needed. For the Callistonauts the ship was home, transportation and undisturbed lab space. That was as near Utopia as they ever expected to come.

Having watched ants and speculated on hypothetical space populations for his three days, Tattersall mentally came up for air. He wondered if Allison's sensors were picking up anything new and different. Carmichael may have pin-pointed some new molecular affinities with possible life potential. He found them in the game cubicle, just launching on a session of tick-tack-toe.

"I don't mean to intrude," he apologized. "Just curious about the sensors."

"We've only just begun the game," Allison said. "Afraid I've got nothing you can use yet." His handsome face brightened. "One thing, though. I've made the solar wind visible. The proton flow shows nicely. Carmichael is going to calculate concentration and spacing after we relax a little. I think I've got enough for him to work with."

"Only subatomic particles?" Tattersall was disappointed.

"As of now," Allison said. "I think I've figured out how to broaden the settings, though. After all, it's just radar."

"Plus," said Carmichael.

"Plus," Allison agreed. "Go in the lab and take a look. The screen's on."

Tattersall left them to their game. Since he had been invited, he had no hesitancy in seating himself before the big screen and watching the even streams of tiny blips move endlessly across it.

If he can broaden the settings, he mused, *we might learn something. Visualizing a known entity is just game playing. But some provision for sensing all matter in a section of space simultaneously—now that would be progress!*

He decided he was hungry, so he punched for eggs and bacon and Florida orange juice. He'd had California the last time he recalled eating, but couldn't detect any difference. After plenty of black coffee he was suddenly ready to sleep, which he did for twelve hours.

"I've adjusted the sensors," Allison told him when they happened to meet in the control room a couple of days later. "I get the gross space trash now, meteors and the like, and some gas clouds, mostly hydrogen and helium. Nothing I didn't know to be there but I love to be able to see them."

"Sounds good," said Tattersall.

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He grinned as he added: "I've just had a gentle scolding from Earth Control. They've been trying to talk to us for two days. They seem to think someone should be available for contact at all times."

"Why?" asked Allison.

"They didn't say," said Tattersall. "May I see the screen?"

The dark surface was different now, with blips large and small, some in regular patterns and many jumbled in no detectable arrangement.

"I've raised my sights," Allison explained. "Nothing subatomic showing now. Everything you see is at least molecular in size. But the variety is so great the picture's not very analyzable. Carmichael put counters on some of the commoner items but it soon was evident what they were—so he lost interest."

"Blips the same size don't behave alike," Tattersall pointed out. Long experience watching details of ant activity had sharpened his awareness of minutiae. "If there were some easy way to tell them apart, your counting could be done on a much enlarged scale."

"How about color?" Allison suggested. "There's a spectroscopic arrangement I might make that would, I hope, distinguish. If I can pick it up, putting the color on the screen would be a cinch."

HE WENT back to the ants. But he didn't have his usual con-

centration. He found his mind wandering back to Allison's screen with its endless variety and fluctuating concentrations and patterns of little flashes of light. He wondered if closer observation, the kind a student of limited ecosystems could make, would extract any further profit from Allison's detection skills. He watched ants for a day, then gave up.

Allison had been busy. Not only had he changed and modified the emphases of his detectors but he had set up another screen, one that occupied almost one entire wall of the little lab. And it was a marvel of colored blips and clusters of lights, moving and whirling and flowing in dozens of simultaneous patterns.

"This one gives perspective," Allison explained. "The scale is smaller, the area much larger. It is concerned only with molecular clusters, which makes the situation less complex. Any questionable area can be examined in subatomic detail by the more refined sets of sensors which utilize the smaller screen."

"High and low power." Tattersall grinned. "That's as far as I can follow you. But the movement on the big screen is practically hypnotic, now you've got color. Mind if I watch a while?"

Allison waved a hand.

"Feel free," he said. "Watch 'em both. Have a ball. I think I've revealed all the matter that's out there, but so what? I make no organized sense out of what I see."

"There's order," Tattersall said. "That's apparent."

"To you, maybe," Allison said.

"Ye-es," Tattersall agreed. "Maybe to me. That's why I'd better look on."

He spent two Earth days looking on. For a while he and Allison talked but gradually each withdrew into his own area of concern. Allison ever more preoccupied with the intricacies of his sensor complexes, Tattersall just watching—watching. Even the ants had never been like this.

Carmichael brought them back to general awareness.

"Earth Control is in an uproar," he reported.

"Ah," Tattersall said. "We weren't available for verbal communication again. I guess we'll have to watch it."

"Worse. They say we're losing fuel."

"How?" Allison reluctantly left his sensor controls. "We're not under drive. No maintenance systems are malfunctioning. We'd have had the alarm."

"They know how," Carmichael said, "but not why."

"Let's start with how," Tattersall suggested.

"You know the timonium disintegration pattern. The only residue is ionized krypton. When this exceeds the pressure deter-

mined as optimum in the bleed-off chamber, the krypton ions are released as a trickle and the lowered pressure in the chamber initiates more timonium breakdown. The energy so derived is stored in the battery banks. Lowering of their charges can also trigger more fuel utilization."

"There have been no excess energy needs in the systems?"

"None. Utilization is exactly as predetermined."

"So?"

"Krypton ions are being drawn from the bleed-off chamber," Carmichael reported gravely. "I didn't believe it—but I programed all the data and Computer Three says the same thing."

"How fast?" Allison inquired.

"Appreciable," Carmichael said. "We couldn't stand it for too long. We've lost almost two ounces of timonium."

"Where's the energy going? Two ounces of timonium would take our happy home here halfway to the asteroids."

"The battery banks can't overcharge, as you know. So the excess energy is being released as provided for in Emergency Pattern A. We've been trailing a streamer of light like a nova. We can be seen on Earth."

"Man, oh, man," Tattersall murmured. "What was that again about anticipating everything?"

"Even anticipation is based on data," Carmichael said. "We had

no basis for anticipating this."

"Evidently not. We've got to solve it, though. Pronto. What's happening to the krypton?"

"That," Carmichael said, "is the question they pay off on."

THE spaceship *Albatross* hurtled on toward the asteroids, all its systems doing their jobs normally, the habitat of the Callistonauts still exactly as it had been planned. But a fantastic cone of waste light energy flared out behind it.

Then, without warning or apparent reason, the krypton trickle reduced to expected volume and slowly the light died.

"You've lost your tail," Earth Control reported. "Your fuel is now normal and there is no energy loss. We can't detect malfunction or change of rate of anything on the ship. You seem to have a problem we can't help you with—but there isn't at this moment any evidence of its existence. You are completely Go, without any reservations."

"We're out here to learn." Carmichael was at the microphone. "Maybe we were already getting a little dull. You'll be happier, though. There'll be a man on duty in Control until we hatch this egg. So you can have a chat with us anytime."

"Nice of you," said Earth Control.

Back in Allison's lab, Tattersall wondered aloud.

"Why," he asked, "didn't your sensors pick up all that light? We seem to have been the last to know."

Allison showed his even teeth.

"I can imagine the talk. The answer is obvious. We're not adjusted for so-called pure energy. We were looking at matter. The small screen can show the krypton trickle, though. Watch.

In a moment the trailing, wavering series of blips showed on the small screen. Each spread, grew dim, then vanished beyond the focus of the sensors.

Tattersall sat and studied them.

After an hour he said, "Could you readjust the large screen to include particles this small? How about color?"

"Might do."

Allison worked, the big screen panorama shifted. Tattersall watched with an inhuman, endless patience. Finally the pattern of the krypton trickle on the small screen duplicated itself in the corner of the larger as a faint series of purple dots. And Tattersall gave the display his fixed, fascinated attention. At last he sank back with a sigh.

"There's more krypton in the environment out there," he observed. "Not ionized, though. We aren't making the only contribution. Where else would it come from?"

"No idea. It's normally inert, of

course. Only something unusual, as timonium disintegration, can produce it in ionized form."

"The purple is due to it," Tattersall pointed out. "Change the larger screen to molecular aggregates again. Give me a smaller scale, a wider area, more perspective."

He seemed unaware that he was giving an order. He was talking to Allison, but Allison knew that as a person he did not at that moment exist. He was only an extension of Tattersall's thinking, a data-gathering device. He grinned with appreciation as he made the requested adjustments.

"Ah-h!" The ant-watcher's long form settled back in his chair. It was his last word for six hours.

When he was convinced that Tattersall had retired into a thought world of his own, Allison left him. Carmichael, in the computer room, was willing to be disturbed. They discussed the fuel loss problem; Tattersall's preoccupation with the detection screens; the reasonableness of Earth Control's insistence on continually available voice communication. Finally they gravitated to the game cubicle and launched a new tick-tack-toe series, which they agreed would continue, with interruptions for essentials like work, rest and food, until they passed the first asteroid. The winner at this point would be officially designated as champion of the Inner Planets.

A WEEK later all was still well. Mars now loomed larger in the viewports than Earth. There had been no resumption of the fuel loss. Earth Control was almost happy, for voice communication with the *Albatross* had been scheduled for specific time slots and so far every one had been met. Actually Carmichael and Allison had simplified this situation by installing a brilliantly flashing attention light, an alarm buzzer and a microphone in the game cubicle. They could thus conform to the schedule with minimum distraction from the games. They did, however, firmly negate the one activity that would have filled the cup of Earth Control to overflowing. They steadily refused to do public broadcasts.

"We've passed this stage years ago," Carmichael summed it up with finality. "We're the Callistonauts, not show business personalities. We explore. We collect data. We do not entertain."

And from this point of view they would not budge.

They did not forget about Tattersall but they respected his privacy. Apparently he spent most of the week in the chair before Allison's screens but he was seen several times in the corridors. He probably ate and no doubt napped in the chair. The last time Allison checked his equipment, Tattersall was busily making line sketches, one after another, using a small

lap board. Allison was curious but he waited. Tattersall would doubtless report eventually.

And he did.

He appeared at the game cubicle door just after an Earth Control voice check. Allison and Carmichael were between games.

"Request a conference," Tattersall said.

His fellow Callistonauts looked him over.

"When did you eat last?" Allison inquired. "You do look seedy."

"Why—" Tattersall paused and thought. "I don't know. Must have, though. I don't feel weak."

"That's not the way I tell." Carmichael patted his growing paunch. "Why don't we have a meal while we confer?"

He got no negatives, so they shifted to the dining area.

"I like breakfasts best," Tattersall remarked and punched for scrambled eggs, bacon, toast and orange juice. The last item wouldn't deliver until he specified, so he selected California, at random.

"Dinner time for me," Carmichael said and had a steak and trimmings.

"I'll just have a green salad," Allison decided. "I'm over on my protein intake."

"How can you remember?" Tattersall sounded envious of this remarkable ability.

He expected no answer to his question and got none. He sighed.

"Now," Carmichael said, with the expansiveness that a good steak induced, "what's the conference about?"

They all had coffee and were leaning back, more relaxed than anyone on Earth would have believed possible.

Tattersall had brought a small sheaf of his sketches, which he now began to shuffle.

"The topic is appropriate," he said. "Food." He looked considerably better after his breakfast, which, once his attention had been called to it, he had obviously enjoyed. He patted the sketches.

"Food chains, I suppose, would be more specific. I'm well on my way to working out several simple ones."

"You haven't watched ants for a week," Allison pointed out. "You've been living in front of my matter screens. No other life there, I think."

"That's why we're meeting," Tattersall said. "There is."

He slouched in his chair, drank coffee and shuffled the sketch papers.

"You remember my hypothesis," he went on. "You listened, you liked it, it made sense, but you didn't really believe it. Carmichael played around with possible atomic affinities. Allison surveyed the space we're going through but neither of you were thinking in life terms. I was."

He held up a sketch.

"What would you say this is?" he asked.

Allison and Carmichael examined it closely, passed it from hand to hand.

"Well?" prodded Tattersall.

"There isn't a kindergarten within thirty million miles," Carmichael said, "so you must have done that yourself. But as art it doesn't rank high."

Tattersall grinned.

"As a diagram, it's better. That is the commonest matter aggregate in the space around us. Those seven interlinked clusters occur in exactly that relationship. They are, compared to other arrangements I've isolated, quite small, and they exist in countless millions. They're the predominant unit on your big screen, Allison."

He waited and finally Allison said, "Carry on! Spin it out! You've got a repeating pattern and how you picked it out I don't know—but we were sure that there would be lots of similar units. Where's the life?"

"That item you're looking at," Tattersall said impressively, "is what I've tentatively called a diatom. A space diatom. It can replicate itself and I predict that it'll be found to be energy-rich. How it gets the energy, how it holds it, I don't know. Probably one of you will tell me. But there's a space plankton out there and that's the basic form in it."

III

TO THE Callistonauts any point of view, any datum, was considered on its merits. That was among the reasons they had been chosen. So Allison and Carmichael didn't laugh. They thought.

"Diatoms are eaten," Carmichael said. "They form the food base of many larger forms. Does something eat those?"

Tattersall shuffled, handed over several sketches.

"Those eat them."

"The art's no better," Allison commented. "The idea, though, is fascinating. These are bigger, naturally."

"The scale's indicated on each," said Tattersall. "I've used the diatom as the basic size unit."

"You've measured?" Carmichael seized on an interest.

"Actually, no. Everything's relative. Direct comparison. I was depending on you to measure the diatom for me. If I were guessing, I'd say well under a hundred yards in greatest dimension."

"Then the larger forms are miles long?"

"Consider how diffuse they are. Hundreds of miles is more likely. There's plenty of space."

The Callistonauts sat silently, thinking. Finally, Allison: "I'm glad Earth Control isn't listening," he said. "They'd abort the mission and haul us back to be tucked safely away in padded quarters.

Have you lengthened the food chain?"

Tattersall held out another sketch.

"This is really big and incredibly fast. On your screen it looks like a boat outlined with colored lights plowing along in a dark ocean. In its path all these other units disintegrate. I'd say it is sort of a generalized carnivore."

"Abundant?"

"No, quite rare. Only occasionally more than one on the screen at a time. I haven't been able to diagram it well. They're always far off in the distance."

"Afraid of little old *Albatross*?" scoffed Carmichael. "Why, it's not much bigger than a diatom!"

"I don't know why," Tattersall said patiently. "I only know I haven't had one very close."

Allison stood up abruptly.

"Let's look. I'd almost forgotten that we weren't listening to a fairy tale. You've only had the screen at one adjustment. You haven't scratched the possibilities of those sensor banks."

It took time. But they were fed, rested and challenged. Once Tattersall was able to show them the diatom, the rest was easy. And when a diatom, brought up close and carefully tracked, divided while they watched, they finally had no remaining doubts. That empty space in the view ports, all that endless distance, actually teemed with life. In one week of dedicated staring at a screen, an ant-watcher had given a new meaning to space biology.

MARS finally lay behind them. Ahead the first of the asteroids swam into the view ports as tiny, twinkling dots of light. But they went almost unnoticed. At the screens Allison probed, Carmichael measured and calculated abundance and distribution, Tattersall read organization into new light clusters and sketched new life forms. And once again Earth Control had trouble making voice contact. The crew of the *Albatross* had no time for routine. It was working.

Occasionally Carmichael remembered and checked the control room for ominous signs. One day he found them. The entire fuel-use panel glittered with red lights and Earth Control was making frantic signals. Carmichael brought them in.

"You're losing fuel," Earth Control reported. The voice sounded resigned. "Situation exactly as before. You've broken down an extra ounce and a half of timonium and your waste light cone has obliterated our view of Mars. Please check and report."

"You have every indicator we have," Carmichael reminded Earth. "Let's compare each checklist."

He started to repeat them from

memory as was his custom, then stopped.

"Wait," he directed. "There's one thing I can do. I'll call you in an hour. Out."

A few crisp sentences oriented Allison and Tattersall. Allison swung the focus of his sensor banks toward the rear of the space craft, adjusted for subatomic particles and, where he had earlier been able to demonstrate the trickle of krypton ions, a steady purple stream now flowed across the screen. Allison increased the focal depth, watched the ions spread, swiftly cluster with other, different particles, and form large, shadowy blue aggregates. These thinned out with ever-increasing distance, arranged themselves in widespread patterns with aggregates glowing yellow and pink and green. And while the men looked, the krypton flow slowed to a trickle. Allison worked rapidly to decrease his magnification to the level of molecular clusters. The eyes of the watchers, now adjusted to the outlines of diaphanous space creatures, saw a form of unbelievable vastness slowly drop astern.

"Smallest scale, deepest focus," urged Tattersall.

It was enough.

The great shape, faintly limned with electron discharge, swung sidewise, paralleled the course of the *Albatross* and kept pace.

It seemed to loom but Carmichael, calculating, said, "Six million miles, give or take a few, to the nearer edge. One hundred sixty thousand miles long. I think it's aware of us."

"It should be," Tattersall said quietly. "It swallowed us."

Allison and Carmichael viewed their lanky coworker with some admiration. This was objectivity, plus. Tattersall was not impressed by the incredibility of his statement. He simply knew that it was so.

"We've been immersed in Galactic gastric juice?" Carmichael was not jeering.

"NOT exactly," said Tattersall. "As a matter complex it's not likely that the ship is within its frame of reference at all. We're too dense, like a meteor or an asteroid. No, the life form responded to what it could detect and utilize."

"The krypton trickle!" Allison exclaimed.

"Exactly. We could see the ions form complexes, form molecules. Krypton is one of its nutrients, one of its 'tissue' components. Probably in the environment of that entity out there such dainties as our fuel residue are hard to come by."

They sat and studied the screen showing the scarcely visible but still obvious monster undulating majestically along, the clouds of lesser forms boiling around it and swirling and churning in its wake.

"Leviathan." Allison spoke the name with feeling. "Trite, but all

I can think of. At one hundred sixty thousand miles long, gentlemen, that is one big varmint!"

Carmichael said, "We're impressed by dimension, not mass. I would guess that if old Leviathan were concentrated to our density he'd be about the size of a chihuahua."

"Whereas you," Tattersall picked it up, "if you were diluted to his —" he eyed the Carmichael paunch —"would probably extend out beyond the orbit of Saturn."

"An exaggeration," Carmichael said placidly. "But it does illustrate the point."

They all grinned. As would be expected, each had an immense feeling of satisfaction, of well-being.

"We have opened a door," Allison said. "We have two immediate problems, though. One, what can we tell Earth Control? And two, how are we going to make old Leviathan keep his bill out of our fuel supply? Even if we could afford to feed him, which we can't, he may have friends."

"Probably has," Carmichael agreed. "But Earth Control first. I promised to call them in an hour. That was three hours ago."

"Space exploration is an unconventional activity," Tattersall said. "They'll just have to realize that."

Both matters were discussed at length. To Carmichael, as probably the best contact man of the three, was finally delegated the job of

placating Earth Control.

"Snow them," Allison urged. "Tell them how hard we're working on the problem. Don't be handicapped by the truth. They wouldn't believe it anyway."

PERHAPS it was due to the validity of the complex series of analyses by which the Callistonauts were chosen. Accidental compatibility of personalities could have been responsible. The concrete occurrence of the fuel drain may have contributed. Or maybe it was just plain blind luck. But by the time the *Albatross* went plunging into the asteroid belt three brilliant, eccentric individuals had coalesced into a team —the fabulous team your space history records: Allison, Carmichael and Tattersall.

The preoccupation of each with his own concerns gradually disappeared. They had problems in common, problems toward the solutions of which each could make unique contributions. The ants lived their lives almost without supervision. There was little time for tick-tack-toe.

The practical situations among the asteroids kept them for a time from the diffuse matter screens. The first computer was constantly activating avoidance patterns and had reduced the finite speed of the vessel by half. The tiny planets were continually in sight. Meteor nets seined space around the space ship. Cameras recorded on miles of microtape and the telescopes probed without ceasing.

All these activities and maneuvers required energy.

"Dodging and recording all this flying real estate," Tattersall said, "is increasing our krypton trickle. What happens when you throw bread out the back of the boat?"

"You get followed," Allison said promptly. "Everything from gulls to sharks. Let's look."

The space biome seemed unaffected by the many little islands of dense matter. Plankton swarmed. The diatoms, and several forms much like them, jogged across the colored matter in endless profusion. Larger entities darted through them, scooping them up, yet seeming to have no effect on their numbers. And off in the distance, in his usual location off the port bow, Leviathan wallowed along with grotesque ease.

Allison changed the orientation of his sensors, surveying space in every direction. There were new forms, just as there had been every observation session. He looked most carefully in the sector to the rear of the *Albatross*. Far back in the space wake, leisurely zig-zagging, a foreshortened hulk of fantastic size came on steadily.

"Another Leviathan type," whispered Tattersall.

"He's gleaning," Allison said. "He doesn't know where the stuff is originating."

"When he catches us he'll sponge a free meal. Goodbye two more ounces of timonium!"

"Suppose Leviathan detects him? There's no reason why the territorial imperative can't pertain out here, is there? This is Leviathan's bailiwick. Why shouldn't he defend it? With his size he needs a really big territory."

Tattersall sighed happily.

"This beats ants four ways from Sunday," he said.

"Don't sell 'em short," Carmichael advised. "You trained on ants."

WITHIN an hour the vast bulk of Leviathan II filled the color screen and overwhelmed it. The familiar outlines of the many known space forms gave way to alien groups and smudges, swirling and roiling in new and different patterns.

"We're inside," Tattersall pronounced. "He has swallowed us."

Allison pinched himself.

"I don't feel any different."

"Look at the krypton trickle. I'll bet it's a river."

Allison adjusted the finer sensor banks. The purple stream rippled and pulsed.

"Our waste light cone is bugging Earth again but don't contact 'em. Let 'em wait. How can we get this thing off us? Or how can we get out? It may have a bigger appetite than Leviathan the First has shown. This could get serious."

"Look at the screen!" Carmichael exclaimed.

The patterns were suddenly familiar again. Diatoms, space amoebae, other plankton and the many forms that fed on them and on each other, all were back—but in a state of wild disorder.

"Smallest scale, deepest focus," Tattersall urged breathlessly.

Allison worked.

Far in the distance two vast forms swung around each other in a swift and sinuous dance, flashing across millions of miles of space as they feinted and parried like fighting porpoises. They came together with impact that seemed to blend their diaphanous outlines, then bounded away with forms unimpaired.

"Sic 'im, Leviathan!" Carmichael whooped. "You can handle him! You've trained on the best krypton!"

It was a brief battle. One monster made a wide sweep—then, instead of closing the circle, it kept on going. In minutes it was out of range, completely undetectable.

"But who won?" Allison asked plaintively. "They looked exactly alike."

"Doesn't really matter," said Tattersall soothingly, "but if it'll make you feel better, that's our old friend out there. A dog generally wins the fights in his own yard. And look where he's positioning himself."

The huge outline was again in

convoy position, plunging along far off the port bow, pacing without effort the twenty-five-thousand-mile-an-hour speed of the *Albatross*.

"He's not about to be ousted," Tattersall said. "He knows we give krypton ions."

"Maybe I'll grant that." Carmichael looked only mildly dubious. "He's still a problem, isn't he? He won't be content to sniff the fragrance. He'll be back for another feed. And another. And another. He keeps off others—but we can't afford him."

"I've been thinking," Allison said slowly. "If he can be attracted, it follows that he can be repelled. Rats learn from mild electric shocks. Dogs won't eat food with pepper. You follow?"

"You want to teach him *no-no*? I'm sympathetic. But how?"

"Feed him something he doesn't like."

Tattersall chuckled.

"You have an idea," he said, "but you've created another problem. What doesn't he like?"

"You've watched the life forms," Allison pointed out. "You discovered them, discovered their behavior. But I've looked more closely at their compositions. I've identified a number of atomic and subatomic particles out there. And many that are common to large aggregates, to suns and planets and asteroids, are missing in open space. We've got pure elements. Let's feed him a small dose of one not a part of his structure or his environment."

"Oxygen?" Tattersall's eyes gleamed. "It's active, we can release it in minute amounts and it might make a nice paradoxical irritant. No life we've previously known can exist without it. But I seem to remember that it isn't found in practical quantities in space."

FOR the first time the crew of the *Albatross* grew impatient as it waited. It had baited a trap and the quarry would not come in. Between stints in the control room Allison and Carmichael played space chess but neither cared who won. Tattersall alternated between his ants and Allison's screen, where Leviathan rolled tranquilly along his chosen track, day after Earth day.

"Krypton must just be dessert," Tattersall decided. "He really doesn't need us."

But their monster-watch came to an end, as it had to. Tattersall saw him as he peeled off, swung in a million-mile circle and dropped in behind the *Albatross*, following up the spreading ions of the krypton trickle. Allison and Carmichael left a game unfinished.

Leviathan came on steadily. The space life boiled away from his snout, then the screen no longer showed it as he engulfed the spaceship and speeded up the trickle of

the appetizing krypton.

"We're inside," exclaimed Allison.

"Here goes," Carmichael said and pressed a release button.

The tiny jet of oxygen would not have sustained a mouse for a minute but the colors on the screen rioted. In an instant the swarming plankton were visible again, roiled and lashed as by a typhoon. Allison worked swiftly, deepening the focus of the sensor banks.

Far off to the sunside of the little ship Leviathan flung himself about with frantic abandon, swapping ends like a bucking horse, probably creating untold havoc among the packed shoals of lesser life. Three pairs of human eyes stared in fascination.

"Look well, gentlemen," Carmichael said in a hushed tone. "Never, I think, will you see a more colossal case of celestial belly-ache."

An asteroid, one of the largest they had recorded, lay directly in the path of the plunging, writhing monster. The little world, its sunside glittering, was not obscured and had no effect as it drifted through the diffuse mass from end to end. Miles in diameter, it was nothing Leviathan could detect, nothing of which he could be aware.

"On through like an aspirin tablet," Carmichael said with awe. "Fellow dreamers, how are we going to communicate what we have seen on that screen? Who will believe in the space biome? We can't record it."

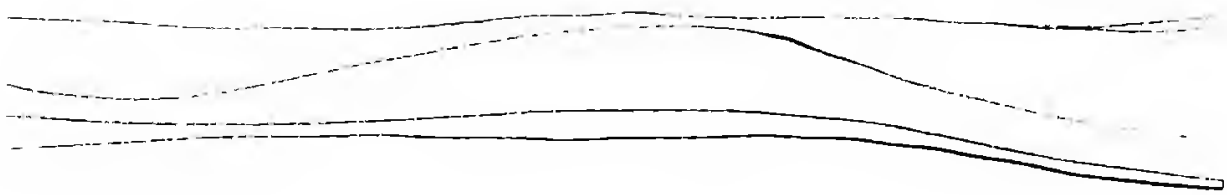
"Not yet," Allison said, "but we will. As I see it, Callisto and the Jovian complex have become secondary for us. We're the first space ecologists. Our job is and will be to analyze the life between worlds, the life between suns."

Tattersall nodded his rough head slowly.

"We've got the biggest ecosystem of all," he agreed. "We've got the Universe!" ✦

DISCOVER A LATENT MOSES

MICHAEL G. CONEY



Green Earth was a memory—and memories were not for builders

I

SWITCH and Cockade were talking together in the ice corridors.

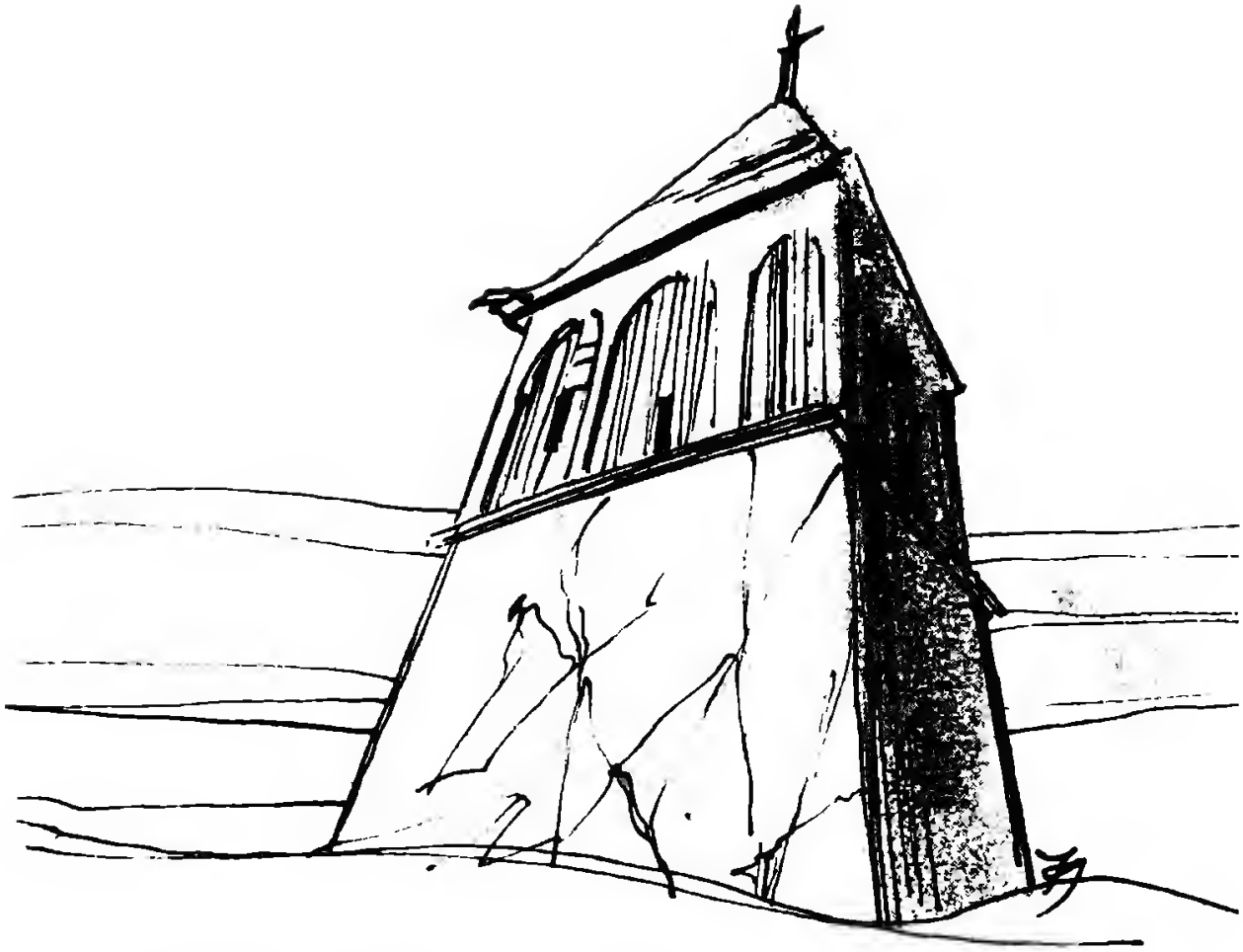
"I don't like it," Switch was muttering nervously, his forefinger tracing abstract patterns on the roughly hewn walls of the tunnel.

"What can we do?"

Cockade held the lamp which reflected infinities in the ice around them. Her voice echoed shrill and hollow.

"I don't know what the hell we can do except just get out."

They were walking again; the corridor widened, although Switch was still obliged to stoop. Weirdly refracted through thin ice, the giant word SUPERMARKET danced in the glow of Cockade's lamp.



"Why don't we, then?"

"Two of us—alone?"

She was stacking cans on a rough sledge while Switch chipped at the shelves with his pick. The lamp was on the floor, smoking black.

"Just the two of us? We wouldn't stand a chance." He paused in his work to watch her face hopefully. Maybe they would stand a chance. Maybe. "The flesh hunters would get us, right away."

"Not if we took Jacko's snowboat." Her voice was sly.

"Just take it? Just sail it away, you mean?"

"Yes."

"I'm not sure I know how."

"I do." She looked smug. "Sometimes he took me hunting with him. Before you came, that is. I can sail it quite easily."

"What about Jacko and the others?" Switch was experiencing a belated twinge of conscience. "What will they do? How will they manage for meat?"

"There's plenty down here."

"Yes, but it's not fresh. It's been here for years and years. It's good to have fresh meat sometimes. I wonder if Jacko had any luck today."

His broad face lightened with anticipation.

"Don't you want to get away?" She leaned toward him, eyes narrowed. "Do you want to stay? Is that it?"

"It's not too bad here."

"Look—" She raised her hand before his face, fingers spread, ticking off points. "The flesh hunters know we're here. The Old Man won't leave. Jacko won't leave without the Old Man. Shrug and Paladin won't leave without Jacko. Soon the flesh hunters will come and we won't stand a chance. Don't you see, Switch? We've got to move on."

The sledge was fully loaded now. They began to pull it back along the ice corridor. Two human beings—the man dressed in a skin-diving suit with a tweed jacket over the top, the woman in wellington boots and a sable coat. Trudging along the blue-silver ice tunnel, dragging a sledge stacked with canned food from an entombed supermarket.

"We've got to move on," repeated Cockade her voice urgent.

THE Old Man was talking to Shrug and Paladin in the bell tower.

"I've seen them all." His voice issued piping from misshapen lips. "Cattle, sheep, pigs, goats, horses —domestic animals, they called them. Milk, wool, fresh meat whenever you wanted. You wanted fresh because you had run out? You killed a domestic animal. Except horses." He shook his head sagely. "You didn't eat horses."

"Why did you keep them?" asked Paladin.

"To ride. You rode them across the fields, along the roads, hoofs clattering, galloping, the wind singing in your face, the hoofs beating time."

The Old Man's skin was flushed, like raw chewed leather. His eyes, shining, far away, looked across sixty years.

The old fool will have another turn unless he takes it easy, thought Shrug in the corner, taking another swig of Harvey's Merienda from the dark bottle.

"Didn't the horses hoofs sink in?" asked Paladin eagerly.

He was about twenty-six, pale-faced and intense, a dreamer. The Old Man's words lent his dreams shape and substance.

"Of course not. There wasn't any snow, not then. Only in winter, that is. No. The land was firm so you could walk on it, like this

floor. All these buildings joined by tunnels—once they stood firm on the land, open to the sky. There was no snow. Only in winter, that is. Then the snow would lie a foot thick, at most two feet—and when you waded through it you could feel the land solid beneath."

Shrug, listening, shivered, remembering his last trip Up Top. Jacko had taken him in the snowboat to hunt Pads and a gust of wind had capsized the vessel. He had sunk into the powdery snow, thrashing with his legs in search for a footing and finding none. The snow was up to his shoulders before Jacko, spreadeagled on boards, had reached him and dragged him to safety. That was the last time he had gone Up Top.

The experience had led to a recurrent dream which tortured him on the days when Switch forgot to bring liquor back from the Wine Lodge. Again he had fallen into the snow but this time Jacko was nowhere near. As he sank, shouting, his feet touched something and he thought, *I'm saved.* It was the roof of the Wine Lodge, a mere five feet below the surface.

But the roof was steeply pitched and slippery and Shrug's feet, although performing the motions of running, could not obtain purchase. For minutes he ran up the slates while all the time his feet were losing ground and he was slipping deeper, deeper into the snow. He was screaming.

He usually woke at this point to find one of the others slapping his face and shouting at him but it always took him some time to recall where he was. He was glad to see the others, although they were annoyed at being disturbed by his yelling.

But suppose, one day, they didn't wake him up.

He took another drink and looked around the small bell tower, timber-strutted and comfortable. Against one wall was nailed a ladder leading to the hole in the spire Up Top, where Jacko went. There was a square hole in the floor beside his mattress and a flight of steps leading down to the ice tunnels. Life was simple and straightforward in the bell tower.

The Old Man was still talking—he was always talking.

"There were the cars, too, and the trains and the airplanes, carrying you fast and safe, much better than the snowboat. They didn't rely on the wind—they had their own power, built in. I used to go to car races sometimes. The Monaco Grand Prix—that was a sight. Cars weaving in and out between the houses like wheeled rockets, their exhaust noise bouncing from the buildings like bombs. The drivers were princes, the winner a crowned king."

Paladin sighed. His eyes burned.

"I should have liked to have been a racing driver," he whispered, hands crooked around the

wheel the Old Man had pictured for him so many times. "I would have won—they would have crowned me King Paladin. There would never have been a driver like me."

Shrug laughed harshly from his corner then listened, cocking his head.

"Quiet," said softly. "I think they're coming."

A regular thumping could be heard, the familiar sound of Switch and Cockade dragging their sledge up the stairs, punctuated by the occasional rattle as a can slid over the backplate and went tumbling back down. Next, a scraping as they reached the floor below and pulled their load over to the stockpile—then the *clack-clack* of unloading and restacking.

Presently Cockade's head appeared, disembodied, through the hole at floor level.

"One of these days you lazy bastards might come and give us a hand," she shrilled, heaving herself through the hatch and sprawling on the dirty floor.

Switch arrived next, glancing guiltily at the others and lying down beside her.

"What did you get?" asked Shrug anxiously, misinterpreting Switch's sheepish look.

Without replying Switch handed him a bottle, which he examined in the light of the lamp Cockade had placed on the floor.

"Tonic Wine," he said, recognizing the label without reading it.

"What the hell did you bring this junk for?"

He uncorked the bottle and drank.

"Long way to the Wine Lodge," explained Switch briefly. "There's been a fall," he added as an afterthought. "We had to get what we could from the Supermarket."

"A fall?" Shrug was alarmed. "It'll have to be cleared."

"You volunteering?" asked Cockade sharply.

A potentially awkward situation was averted by a sudden fading of the light. A figure was backing clumsily through the gaping hole in the spire, feet feeling for the ladder. Jacko was home.

"Flesh hunters," Jacko said.

"I'D SHOW them," Paladin shouted, feet clattering on the wooden floor as he capered, his shadow dancing on the walls. "I'd mow them down, whoosh, whoosh, one after the other—" He brandished a broken lath, cutting and slashing, driving his imaginary opponent to the wall and dispatching him with a thrust to the gut. "Take that, you swine—"

"Whereabouts?" asked Shrug nervously, propped up on one elbow.

"Over to the southwest," explained Jacko, pointing, his tall figure dwarfing Paladin. "Ten or twelve there were, about three miles away. I was following a Pad

when I saw smoke from a square roof beside a spire—then they appeared out of the smoke. They were carrying things—people, I think, and they dumped them on sledges. They pulled away on skis. They went north."

"They know we're here," muttered Switch. "It's only a matter of time."

"I don't think so." This from Shrug. "I reckon they'd have been here already, if they'd known."

Cockade sniffed.

"You're too bloody idle to move." She tore a strip of flesh from the ham of the Pad sizzling on the improvised spit. They were all gathered around the fire glowing in the huge, tilted bell. "If you saw them coming, Christ, you'd just have another drink and welcome them in. You're so damn pickled you wouldn't feel their knives."

Shrug belched in disgust, staring into the fire.

"I remember the green fields," mumbled the Old Man. "It wasn't always like this—oh, no. In those days a man could walk in the fields, on the roads—anywhere—safe. No flesh hunters then."

"Jacko." Cockade's voice was sharp. "Tell that old fool to shut up. He's just not with it. Now—" she regarded them all one by one, sizing them up—"what are we going to do about it?"

"Defend ourselves." Paladin laughed recklessly. "Mow them down, one by one, as they come through the hole."

"No chance of that." Switch's mouth twisted in a sneer. "They'll smoke us out—that's the way they work. They'll pour petrol in here and set fire to the place and we'll get the chop when we climb out, coughing up our guts."

"What do you think, Jacko?" Cockade asked. She moved close to him, putting her arm around him the way she used to before his indifference got her down and Switch arrived. "Can't we go and find somewhere else?"

Her voice was unusually pleading.

"I'm not leaving the Old Man."

He said it flatly, as if reciting a catechism by rote.

"For God's sake." She flung her arms wide. "Can't you forget about that old fool? His time's nearly up, anyway. It's us that matter—the young ones, you and me and Switch and Paladin. And Shrug. Not that old parasite."

"You can go without us if you want."

"How? We haven't got a snowboat."

"Build one."

"Build one? That would take weeks. We haven't got time. Look —" she lowered her voice to a persuasive wheedle—"if you're that fond of the Old Man, why not take him with us? All of us, with the snowboat and the sledges and skis."

"You know he's too old to stand any journey."

"It's the colors I miss most," the Old Man was saying, his voice filling the sudden silence. He had been speaking quietly all the time. "The green fields and the red roofs. The blue sky and the white buildings. Not like here—here everything's brown. Brown walls, brown floor, brown roof. Brown dirt. This place is the color of decay—"

"Tell me about the fields, Old Man." Jacko squatted beside the thin, ragged figure. "Tell me about the trees and the hills."

His eyes were far away, imagining what he had never seen.

"The hills were purple with heather and the trees were emerald in spring and gold in autumn—and even in winter there was color, with the berries and the birds."

"Tell us about the birds," Paladin murmured, sitting down.

Cockade shrugged, then sat down, too. The discussion appeared to be over. Discussions were futile anyway.

II

A JAGGED shaft of light speared through the hole in the spire and Cockade stirred, grumbling to herself. She opened her eyes reluctantly and, rolling over, found herself looking straight into Switch's face, bloated with sleep. His skin was flushed, his breathing stertorous. She shook him disgustedly.

"Wha'?" He squinted at her, tiredly.

"Wake up. I want to talk to you."

"Later."

He rolled over, facing the other way.

She shrugged and lay down again. It could wait. As long as they didn't leave matters too late.

Occasionally the bell tower trembled to the touch of distant, underground thunder.

PALADIN dreamed, sweating with his dream companions at the mortar, dropping in the canister, *whang* as it sailed away over enemy lines. *Whump,* as the charge exploded, killing, maiming, a cylindrical emissary of death from him, Paladin. *Whump*. He grinned fiercely in his sleep.

THE Old Man dreamed of rainbows. Jacko awoke, stretched and scratched himself, looked around and rose quietly to his feet. He stretched again, sinews crackling, and yawned silently. He shrugged his shoulders into a well-cut overcoat, made for the ladder and began to climb. As always he paused at the hole, scanning the horizon for signs of strangers, then stepped through into the snowboat tethered outside.

The eternal wind swept by as it had for years, no stronger, no

weaker—just a continuous driving wall against which a man could lean. The surface of the snow was rippling waves, the tips whipped off by the wind into a shallow mist so that the waves themselves swam out of focus.

Jacko untied the painter, hoisted the sail and pushed off with his foot. The boat moved away slowly at first. Then, heeling as it left the lee of the spire, it raced across the snow with a keen hissing. Jacko settled himself in the stern, letting out the mainsheet. He set a course for the southwest.

Behind him the only evidence of the buried village was the church spire, projecting solid and incongruous from the shifting field of silver.

SHRUG worked intently and fast, striving by concentrated thought and effort to outpace and put behind him the demons of the night. He had seen them so clearly that he knew—surely he could not have been dreaming those huge white shapes which had paced the bell tower toward him, stepping through the vanished bodies of Switch and Cockade, Paladin, Jacko and the Old Man and coming for him only—him, Shrug.

He had screamed once and Jacko had suddenly been there, bending over him—but still the Pads had come on inexorably, pacing about the walls and occasionally dropping to all fours, circling, but all the time closing in on him. Jacko had returned to his mattress and gone to sleep again, ignoring the white beasts.

So, as soon as he felt a little better, Shrug had risen, lit a lamp and descended the steps to the ice tunnels. Stooping, he had scuttled along the corridors, past the tailor's, Woolworths, the Supermarket - then turned left along the spur which led to the Wine Lodge. It was months, maybe years, since he had last been in the tunnels—certainly he had not ventured here since Switch had arrived. Since then he had relied on the others to bring his supplies.

Finding the spur blocked by the fall Switch had mentioned, he had retraced his steps to the ironmongers, where he had obtained a spade and a case of blasting charges and fuses. A couple of satisfactory explosions had reduced the ice boulders to powder without bringing down the roof and he was now shifting the rubble.

His back was already aching. A dull throbbing concentrated around the lumbar region rose to a crescendo of pain each time he lifted the spade. The sweat oozing from his body felt as if it were solidifying to ice drops on his skin, so intense was the cold in the tunnel. He was seized with bouts of shivering as he toiled.

For the time being, however, he had conquered the demons.

As he worked he thought of

Jacko and wondered once again why the big man stayed with them. Was he thinking of founding a tribe? If so, the material with which he was starting was hardly inspiring. An alcoholic, a mental case and a dotard—which left Switch and Cockade. These two had been together for some time now—ever since Jacko had saved Switch from the flesh hunters and given him Cockade—but there was no promise of children on the way.

No. Jacko would be better off elsewhere. He could be a leader in one of the larger communities if he chose—there was no need for him to stay here in this doomed group. Maybe Jacko was just a philanthropist.

Shrug considered Jacko to be the finest person he had ever met.

He labored on, shoveling, shoveling in the tunnel too low to allow an upright stance and barely wide enough to permit him to swing the spade. Frequently—as he turned—the spade caught on the rough wall and spilled the contents in exactly the spot from where they had been lifted. When this happened Shrug cursed quietly and sincerely.

After a while he could no longer think even of Jacko and concentrated on his goal, striving with what little will remained to visualize the Wine Lodge, the row upon row of bottles—brandy, whiskey, gin (but hadn't Switch said they were all gone now?), vodka, creme de menthe, Pernod, Cherry Heering, Drambuie, Glayva and hundreds more besides—all glowing with their bright labels. And then the ports and sherries—Old Monk, Directors' Bin, Bristol Cream, Rubio, even Whiteways' British. A bottle of Whiteways' British would go down very nicely right now.

THE mother Pad and her two cubs hadn't caught Jacko's scent. He approached upwind—tacking the snowboat silently and expertly against the stinging, snow-laden breeze—and reached for his rifle. Within range, he turned the boat directly into the wind and, as she slowed and the sail began to flog, he moved forward to the bows and raised the rifle, balancing carefully and sighting along the barrel.

The crack of an unexpected shot was borne downwind and the mother Pad reared up, standing huge and white on her grotesquely splayed hind feet, peering myopically this way and that, head thrust forward. Jacko waited, lowering his unfired rifle. Someone else was after the beast. It was good policy in such cases to keep quiet and await developments—to ascertain the strength of the opposition before acting.

Soon he saw them, a group of indistinct shapes beyond the Pad, moving fast downward on skis, in his direction. As they approached

he recognized the huge, winglike sails extended from each man's shoulders—these were the flesh hunters. With the bellying silver material straining from long poles strapped horizontally across their shoulders they had the appearance of giant birds of prey, swooping towards him.

There must have been a dozen of them and a distant shout warned Jacko that he had been sighted. A fusillade of shots sounded as they gunned down the Pad and her cubs and, leaving two men to guard the bodies, swept toward the snowboat.

Meanwhile Jacko had been sawing the tiller frantically. At last the bows of the vessel unstuck from the teeth of the wind and the sail filled. He spun the snowboat almost in her own length and began to pick up speed, running before the breeze, the shouts of his pursuers shrill in his ears. He was in a bad position. He could not outrun them—his only chance was to outmaneuver them.

Gradually he altered course on a wide curve until the wind was blowing from abeam. Another crackle of shots announced that the flesh hunters had guessed his purpose and a part of the force parted from the main body to head him off, fabric shivering and skis throwing up cascades of snow as they endeavored to sail close to the wind. Jacko watched them anxiously. These men were experts.

The snowboat scribed a wide arc on the drifting sea of snow. Not far behind flew the birdlike sail skiers—a predatory flock but losing ground gradually as the arc took Jacko's path aslant to the wind. But then, cutting inside on a chord to the arc, raced the real danger, the smaller group of skiers on a parallel course and closing in.

The main body of his pursuers was definitely falling behind. It was not easy to point close to the wind with shoulder sails. The sails were designed for use with the wind behind with the full length of the skis acting as an effective, steady platform.

But the smaller group was coming on, shooting, closing in. These men were proficient.

Jacko quickly decided on a final, desperate maneuver. No matter how accomplished a sailor a skier may be, a snowboat will always have the advantage on a really close haul. Dragging the sail tight, Jacko pointed the vessel as close into the wind as he dared, on a course that would intersect his pursuers at a point some eighty yards ahead. The snowboat heeled alarmingly, running almost on her gunwales.

Then, as he closed with the flesh hunters, he threw himself to the floorboards, hidden from the men by the angle of the heeling hull.

He heard the smack of shots tearing through the light ply and waited for the numbing shock of a

bullet in the back--then the weird shape of a skier passed close astern, towering over him, staring down at him and trying to get a revolver to bear but hampered by the straining shoulder sails. A few shots spattered harmlessly into the woodwork and within seconds the danger was past as the figure disappeared from view. The flesh hunters had been outmaneuvered.

After a while Jacko set an easier course and headed for home. It was too dangerous on the snowfields, that day.

THE glow from Shrug's lamp revealed row upon row of empty shelves and for a while he stood motionless, struggling to understand. The icy, tomblike atmosphere was chill to his skin and he was shivering while his stomach, bereft of nutrient alcohol for several hours, was rebelling. He swallowed heavily.

It was inconceivable that he had drunk the place dry over a period of a few years. He had been obtaining his drinks from the Wine Lodge for so long that he had subconsciously come to believe that the supply was inexhaustible. More recently Switch and Cockade had been doing his shopping for him, so any diminution of the stock had not been apparent to him. They had brought him the bottles and when he had drunk them they had brought him more. He had had no reason to believe that the state of affairs would not continue forever.

Presently he lay down on the floor, the lamp beside him, his face gray, his beard reflecting sparks of light from the trapped ice particles.

"WHEN I was a young man," the Old Man was saying, "this village was called Manaton, I think. Or it may have been Bickleigh."

"Where's Shrug?" asked Switch suddenly.

"It's difficult to tell just from a church spire--But to me this seems very much like Manaton."

"He wasn't here when I woke up," said Cockade.

"You used to live in this part of the country?" asked Paladin. "Before, I mean?"

"I think so. It's difficult to tell."

"You've got no idea," remarked Cockade acidly. "You don't know where the hell you are. You live in a world of your own. Christ, you haven't been outside the bell tower since I can remember."

"True. But then, don't we all live in our own private worlds now?" The Old Man, surprisingly, seemed to be entering into a discussion. "Not only mentally but physically as well? When did you last go Up Top?"

Cockade shifted uneasily.

"More recently than you anyway. And I go down to the tunnels often."

"But what about your mind? I heard you talking about Shrug just now. Did you think: *Shrug's not here?* Or did you think: *Shrug's down in the Stock Room or else in the tunnels* . . . and could you visualize him there?"

"I just thought he wasn't with us, that's all. So what?"

The Old Man chuckled.

"So Shrug had moved out of your private world both physically and mentally. And for you that was the end of the matter."

Paladin showed signs of alarm.

"I don't think he ought to be down in the tunnels. He's not well. He was screaming again last night."

"Well done, Paladin. We'll make a human being of you, yet."

The Old Man looked pleased.

"All right. All right." Cockade was annoyed. "What do you think about, Old Man?"

"Jacko, mostly. I wonder what's happening to him when he's Up Top—and if he's safe. I worry a lot about Jacko. He's been a good friend to me."

A maudlin note entered the Old Man's voice. His moment of lucidity was over and he was about to commence another monologue.

Fortunately for the others there was an interruption. Jacko had arrived and was descending the ladder. He jumped the last few rungs to the floor, landing with a thump.

"Christ." He threw off his coat and crouched before the fire, rasping his hands together. "I've had a hell of a morning " He glanced around. "Where's Shrug?"

Silence.

Then: "We don't know," said Switch. "We think he may be in the tunnels."

"You knew he'd gone alone and you didn't go to look for him?" Jacko's expression was ominous. "Oh, for God's sake—"

Putting on his coat again, he made for the stairs.

SHRUG lingered below the surface of consciousness for a long time, as though in suspended animation. He was dimly aware that he was back in the bell tower. The wooden floor was warm to his back and he could here the voices of the others discussing him. His thoughts were slow and strangely clear, as though purified from extraneous influences and distractions.

The group in the bell tower had a purpose. He could see that now but the reason behind the purpose was more difficult to define. The purpose of the group, directed by Jacko, was to sustain the life of the Old Man, who otherwise would have died. All action was directed toward that end. The reason for prolonging a useless existence? That was more difficult. Maybe the reason was that, without a reason, there would be no purpose. So there had to be a reason, otherwise

the purposeless group would scatter and the individuals would not survive.

No. It was not only that. Jacko himself was another reason. It was a condition of Jacko's looking after them that they all cared for the Old Man. And without the leadership of Jacko they would all perish. So they did what Jacko said and sustained the Old Man out of fear that otherwise Jacko would go.

What a pity that all their efforts were concentrated on preserving and encouraging decay.

If only Cockade were pregnant, that would give them all true purpose.

What would happen if the Old Man died today?"

Why was the Wine Lodge empty?

Why had Jacko saved his life again when his, Shrug's, survival was not essential to the well-being of the Old Man?

Was Jacko real? Or was he an ephemeral antithesis to the ghostly Pads who came at night—a sort of Christ?

His mind a seething turmoil of unanswered questions, Shrug returned moaning to full consciousness.

III

"SWITCH, come up here quickly." Jacko was standing on the ladder. His head was level with the hole in the spire. Switch left Cockade and joined him. "Look."

Together they stared out across the snowfields.

About a hundred and fifty yards away, indistinct in the driving snow, clustered a group of men. They stood motionless, sledges at their feet, obviously discussing a plan of action that could only concern the spire—there was no other landmark to discuss. They were, clearly, flesh hunters.

All this Switch divined in a matter of seconds before he hastily descended the ladder, almost falling into the arms of Cockade.

"What is it?"

"Flesh hunters," he said, trembling uncontrollably. He had not set eyes on the snowfields for a long time—the men out there were not his only enemies.

Jacko called down, "I think it's the lot that was after me this morning. They must have followed the direction I took."

Paladin joined Jacko at the hole.

"Christ—" he muttered, counting. "There's over a dozen of them. Do you think we can hold them off?"

"We'll just have to try, won't we?"

A figure detached itself from the group and approached, gaining focus with proximity, moving laboriously against the wind on broad skis. Paladin could see the eyes, red-rimmed within a swath-

ing of fur, regarding them.

"What do you want?" asked Jacko quietly.

"How many are you?"

"I said, what do you want?" repeated Jacko.

The eyes narrowed and Paladin felt that under the furs the mouth was grinning mirthlessly.

"We want food," came the muffled voice, "and drink and women. We want shelter, clothes, guns, ammunition. We want everything you've got."

"Try it," said Jacko.

"Try it!" yelled Paladin suddenly. "Yes, you just try it, that's all! We've got guns enough to hold you all off. You don't stand a chance. Hey, Cockade!" He shouted down to the others. "Pass me a rifle. There's a man up here wants trouble." He stared at the fur-covered figure ferociously. "You want trouble, we'll give it to you. You just try us."

"We will," replied the man.

He gazed at Paladin, who stared back.

But after a moment Paladin's eyes dropped.

"THEY'VE upended their sledges," reported Jacko from his post. The bell tower reverberated as he sent a shot whining out across the snow. "I think they're going to wait until dark. At least I can pin them down for the time being." He fired again, uselessly, at the thick timbers of the improvised shield.

An answering shot sang through the hole as Jacko ducked. The slug smacked into the beams of the spire, raining dust and bat guano upon the group below.

"What are we going to do?" asked Paladin nervously. "When it's dark they'll take us easily. If we guard the hole they'll chop another one and set fire to the place." He moved toward the stairs. "Let's go down to the tunnels. We'll be safer there."

"Don't be a fool," called Jacko, peering down at him. "If they take the bell tower they've got us. There's no other way out!"

"What's going on?" whined the Old Man, sensing uncertainty around him.

"Flesh hunters Up Top," Shrug informed him with a certain relish.

"You're supposed to be in charge," Cockade called, staring up aggressively. "Can't you suggest anything?"

Jacko did not reply.

Cockade said, "He's had it. He's about as good as a bloody leader as he is in bed. Well, I'm not staying here to be fried." She glanced around uncertainly, her eye falling upon Switch. "Any ideas, lover?"

No reply.

"I might have known it." Cockade was talking fast now, her voice high-pitched. "When it comes to the crunch you men can only think

of yourselves. Every man for himself and the devil take the woman. First Jacko and now you."

"Nobody's running out on you, Cockade," said Switch gently.

"That's because you've got nowhere to run to," she shrilled. "My God, if you had an escape hole you'd be out like greased lightning. Why didn't he think to build an escape hole?" She jerked a thumb upward. "Fine leader he is. I bet when it gets dark he'll sneak out there and make a deal with them. He'll trade his life for ours—"

Shrug slapped her hard and effectively across the face.

Cockade reeled back, hand to her cheek, eyes blazing. Switch moved as if to hit Shrug, then changed his mind, his fist dropping abruptly to his side.

Staggering slightly, Shrug made for the ladder and began to climb. Close beside Jacko, he looked out across the snow for a while. He laid his hand firmly on Jacko's shoulder for a moment.

"Wouldn't you say, Jacko," he remarked, "that those men are about one-hundred and fifty yards southwest from here?"

Then he descended to the floor. The others watched him silently as he made for the stairs.

"HOW much longer before it gets dark?" asked Paladin, standing beside Jacko at the hole.

Jacko glanced at the sky.

"About an hour before they can move," he replied thoughtfully.

"What are we going to do?" asked Paladin because he had to.

He didn't want to fret like Cockade but he just had to ask that question.

"Wait," said Jacko, sending another shot ringing into the twilight.

"I can't stand waiting," replied Paladin immediately, as though he had known exactly what Jacko would say. "I want to fight. Let me have the gun."

He seized the rifle, unleashed a useless fusillade, then handed the gun back, looking suddenly foolish.

"Keep them pinned down as long as we can," remarked Jacko understandingly. "That's all we can do for the time being."

"What the hell are you two cooking up?" yelled Cockade from below.

Paladin ignored her, feeling strangely confident in the presence of Jacko's impeturbability.

"And when it gets dark?" he asked.

"They'll come for us. They'll surround the spire, I should think, and they'll hack their way in at several places." Jacko was talking to himself more than to Paladin, working it out. "Then they'll push rifles through the holes and start shooting. They won't see anything because we'll have put out the fire. In any case, they won't hit us because we'll have withdrawn to the storeroom. So they'll set fire to

pieces of cloth and wood and drop them through—to the floor of the bell tower—"

Jacko's voice trailed off.

The flesh hunters would see that the bell tower had been evacuated—so they would occupy it. They would shoot their way down the stairs, driving the defenders into the tunnels. Then they would hunt them through the tunnels or just leave them there to freeze.

Seemingly there was no escape.

Minutes passed and it grew darker.

"Switch," Jacko called. "You and Cockade get the Old Man down to the storeroom. Make him comfortable and load a gun for him. Shrug."

Silence.

"Shrug?"

"He's not here," came Cockade's voice. "You pal's run out on us. He went down the tunnels—to the Wine Lodge, I expect, to get blind drunk. That leaves four of us against God knows how many. If you think we're going to trust the Old Man with a rifle you must be crazy."

"Paladin," Jacko said tiredly, "go down there and put out the fire. Pour water into the bell and make sure it's really dead."

"What are you going to do?"

"I'll stay up here for a while."

For a long time Jacko stared into the dusk, watching the barricade of upturned sledges until his vision blurred and it seemed that the sledges were moving and there were men everywhere, creeping about in the gloom, at the perimeter of his vision.

This was the finish of the group. Partly he blamed himself. He must have been the one who had led the flesh hunters here, although they would have found the place eventually. The tip of a church spire is a conspicuous object in a landscape of flat snow.

Mostly he blamed everyone. The Old Man, who could have brought wisdom but gave them only senility. Cockade, a barren virago in a childless community—she should feel shame, not belligerence. Switch, a willing worker but nothing more. Paladin, an adolescent coward. Shrug, intelligent and a potential leader except for his overriding weakness.

Had Jacko done the right thing, a few nights ago, when he had worked through the hours when the others slept, systematically emptying the shelves of the Wine Lodge and concealing the bottles in an abandoned spur at the far end of the village? He had hoped to snap Shrug into his senses but he appeared to have demoralized the man. Of course, it was early days to hope for a cure—but unfortunately there didn't seem to be any more days left.

So mainly this was his fault. The leader of the group, he was dull, unimaginative and had proved himself lacking in foresight. Given

another chance—would he do things differently?

Yes.

He had learned now that losses had to be cut—that there was no profit in merely postponing the inevitable. Above all, he now felt that the present way of life was wholly artificial and that life would be extinguished upon the exhaustion of the stockpiles.

For life to continue, there must be a borning and a growing.

If ever he had the chance he would go to the lands that the Old Man had spoken of—to the west, where the hills were taller than the snow and the green trees flourished. He would plant crops and reap their golden harvest. He would build a cabin in the open air. Life would be hard but good—and he would live quickly, rather than die slowly. All this he would do, if he had the chance. . .

A subterranean rumbling shook the spire. The foot of the ladder danced on the floor so that he had to hang on to the rough, split timbers of the hole. He heard distant slammings and a blast of air gusted past him into the twilight. There was a reverberating crash from below as one of the bells broke free from its mountings and thundered, tolling, to the storeroom floor far beneath. Yells of alarm echoed from the group—he could hear Cockade's shrill screaming and looked down but saw only blackness.

Another screaming he heard and he stared into the half-light outside. Where the flesh hunters' barricade had been was a billowing cloud of fine snow, quickly whisked away by the wind to reveal a chasm many yards across. There was scarely a sign of the enemy. As the gulf widened rapidly, the circumference poured down like a bottomless, circular cataract. Wider and wider the chasm extended. He watched as the last sledge tumbled from view.

After a while the rumbling died but the wind whined on unperturbed, as it had for years.

THE lamp was lit in the storeroom. In the flickering glow they stood around the broken body of Paladin.

"Two dead," said Switch heavily. "At least Shrug died to some purpose but this—"

He sighed. Paladin had been the youngest of the group.

"He didn't suffer, Jacko," said Cockade, for once subdued. "He was standing right under the bell when it came down. He was dead when we lit the lamp. I think he was dead before—I didn't hear any sound from him. But it was dark—"

Jacko was silent, looking down at the twisted form, somehow smaller than in life and defenseless.

"What about old Shrug, then?" said Switch with an attempt at heartiness.

Then he remembered that Shrug was dead, too.

"I never thought Shrug had it in him," remarked Cockade, trying to cheer up Jacko. There was something ominous about his silence. "He must have put a match to the whole case of dynamite. It seemed that the Wine Lodge was empty and I suppose he felt that he had nothing left to live for—and the dynamite was there and the flesh hunters were camped directly above. It all added up. He went out like a man."

Like a man betrayed by his leader, thought Jacko: I am responsible for Shrug's death. He regarded the remains of his group, noticing the Old Man lying on a mattress, clad in rags. Why was the Old Man dressed like that? There were plenty of good clothes at the tailor's.

"Thanks, Cockade," he muttered, as though she had complimented him personally. "It's no good, though. We're going to have to split up. We're all dying slowly here."

After a miserable silence Cockade said with somewhat watery brightness, "It's okay, Jacko. You're right, of course. What will you do? Take the Old Man and try to find the hills and trees he's always talking about?"

"Yes, I think so. How about you?"

"Oh, I expect we'll go and join one of the larger communities east. Provided we can steer clear of flesh hunters on the way. We'll be fine."

"Good." Jacko turned away awkwardly. "I'd best be getting the snowboat loaded up for an early start. We've got a long trip ahead of us. I only hope the Old Man lasts out."

Gathering an armful of cans, he climbed the stairs to the bell tower. It seemed that they had all been expecting his decision.

JACKO watched the spire fade astern, then put his gaze on the featureless wastes ahead. He had no sense of adventure. Maybe that would come later, with the sun. At the moment, in the early morning light, he felt despair rather than any other sensation. Failure, as though he were running away, instead of setting out to find a new life. The Old Man, lying on the floorboards, wrapped in rugs, looked like a corpse with his parchment skin, wispy hair fluttering sparsely in the breeze.

On an impulse Jacko bent forward and touched the puckered, sunken cheeks. The Old Man stirred, mumbling.

Straightening up, Jacko sailed on.

SWITCH and Cockade wandered about the bell tower, surrounded by stacks of canned food. They moved in silence, occasionally lifting a can from a stack and replacing it again to give each other

the impression that they were making last-minute checks. From time to time one or the other would glance up at the ladder leading to the hole in the spire.

"Well, I think that's about it," remarked Cockade at last with studied casualness.

"Yes," agreed Switch.

"Going to load the sledge, then?"

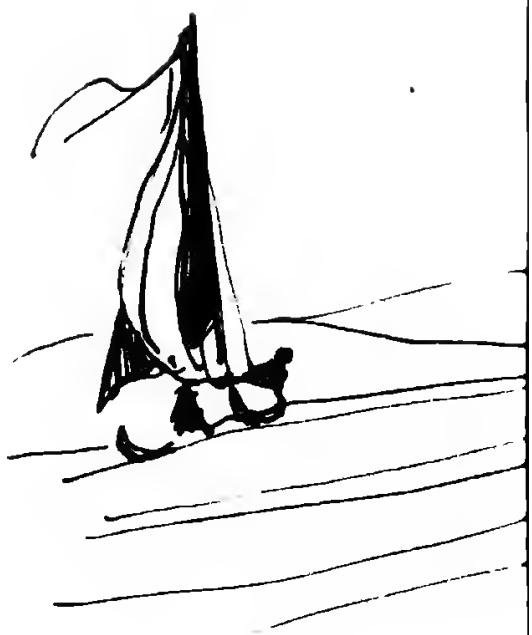
"Right." Switch dropped a selection of cans into a string bag. They made a dull clatter. Jacko had already fixed up a sledge for them; it was tethered outside the spire, in the snow.

In the snow, outside. . .

Slowly Switch walked to the ladder and began to climb, one hand reaching for the rungs and the other holding the bag. The ascent was extraordinarily difficult —the bag was heavy and the floor below seemed somehow to impede his progress like a magnet. The task of lifting a foot to the next rung took his entire concentration. He noticed that the rungs were worn in an area around the center of each tread, so that the square section had become almost oval and he focused on speculating upon this indisputable, physical fact.

Suddenly his reaching hand encountered no rung and he could feel the wind on his face. Jacko was not beside him this time. He looked up.

There was the snow, a vast area of tossing, drifting whiteness under



a sky equally white, so similar that he could not tell where the two joined; which was the top and which the bottom, the snow or the sky. It was a vision of infinity composed of two physical elements, snow and sky—and Switch, a small mammal clinging to the fringe of this greatness, was utterly, totally insignificant.

It beckoned him like a tunnel. It repelled him like a wall.

"Get on with it."

Gasping, retching, he clung to the ladder, shutting his eyes and concentrating on the existence of the rungs beneath his hands and feet, the only solid objects within his present frame of reference. Dimly he heard the bag of cans clatter to the floor below.

"What the hell's the matter with you?"

He moved over—or was pushed aside—as Cockade climbed up beside him. Together they crouched at the top of the ladder, Cockade staring at the snow, Switch regarding Cockade. He saw her eyelids droop, flickering, and caught a flash of white as her pupils turned up, vanished under the lids. He grasped her around the waist as her eyes closed.

She shook her head.

"Christ," she muttered.

He followed her down the ladder.

As they stood in the bell tower looking at each other they heard the sound of footsteps, heavy and slow, ascending the steps from the storeroom. Suddenly Cockade was in Switch's arms and they clung together. He could feel her heart racing as he watched, over her shoulder, the square aperture in the floor.

Shrug appeared, rubbing his head.

"Hi, there," he greeted them. "God, I took a knock down there. The blast through those tunnels—I just about made it to the tailor's before I passed out again. I must have slept the clock round. Feel better for it, though. What's for breakfast? Or am I too late?"

"Shrug—" Cockade had twisted from Switch's arms at the familiar voice. "What the hell are you doing here?" Suddenly she was crying. "We thought you were dead."

"I've never known you so glad to see me." Shrug chuckled. "No, I'm not dead. Why should I be?"

"We thought you blew yourself up with the Wine Lodge."

"What?" Shrug laughed openly. "Me blow myself up? Do you take me for some sort of bloody hero?"

HE LAY more easily now, propped up in the stern of the snowboat. He looked around, eyes shining.

"It doesn't change," he murmured. "I'd amost forgotten what such colors look like. Have you ever seen green like that, Jacko?" He pointed up at the giant, branching column he called a tree, tan-

gled against the staring sky. "That color is the essence of life. You can keep your snowboats, your food hoards, your ice tunnels and hidey-holes—all those dreary man-made blacks and whites and grays. And even the shades of gray are somehow the same—the red-gray of dead meat, the blue-gray of chipped tunnels, all created by Man and all dead. That tree is green. It's alive. And it was made by God.

"That is the difference, Jacko—the difference between death and life, between gray and green. Seeing this place I feel as if I had been dead for years and now, when life is soon to leave me, I think I've gotten back what I lost as a child and come alive again."

The effort of talking was weakening him further, his voice was faltering. Jacko kneeled beside him, putting an arm about his shoulders.

"I want you to stay here, Jacko," the Old Man whispered. "Find yourself a wife and come to live here. Stop living in a hole and build yourself a cabin here among the green trees, under the blue sky. Fetch seeds from the stores beneath the snow and grow yourself vegetables—carrots, peas, beans, onions, sweet corn—and around the cabin plant color—orange marigolds, scarlet roses, lupins of every color you can think of and more besides. Surround yourself with life and your own life will be fuller and more worthwhile because you will be living it with God, who never intended Man to grovel underground in caves."

He was silent, watching intently. Jacko followed his gaze and saw, silhouetted against the silver sky, a small, scampering animal in the branches.

"They're all here," the Old Man said so faintly that Jacko had to lean close to catch the words. "All the old animals and birds, too, I shouldn't be surprised. It only needs Man to come back."

His eyes closed and his shoulders sagged suddenly against Jacko's arm. Shivering a little Jacko stood up, brushing the powdery snow from his knees. He took the spade from the bows of the snowboat, dug a trench and buried the Old Man under the trees which he valued so greatly that he considered it worthwhile sacrificing his last few years to revisit.

But Jacko couldn't see it that way.

They call it the bleaches, the condition that affects the eyesight of those who spend their days hunting fresh meat in the snowboats. It comes of skimming through the dazzling snowfields day after day until, at last, there is no need to squint against the glare because the eyes have become completely accustomed to it.

Jacko was fifteen years old when the blue sky finally changed to sil-

(Please turn to page 158)

THE TOWER OF GLASS

ROBERT SILVERBERG

Krug rivaled God Almighty as the creator of Heaven and Earth and Man. Now he just wanted to talk to all three of them!

I

LOOK, Simeon Krug wanted to say, a billion years ago there wasn't even any man, there was only a fish. A slippery thing with gills and scales and little round eyes. He lived in the ocean and the ocean was like a jail and the air was like a roof on top of the jail. Nobody could go through the roof. You'll die if you go through, everybody said, and there was this fish—he went through and he died. And there was this other fish that went through and died. But another fish went through and it was like his brain was on fire and his gills were blazing—the air was drowning him and the sun was a torch in his eyes and he was lying there in the mud, waiting to die—and he didn't die. He crawled back down the beach, went into the water and said, *Look, there's a whole other world up there.* And he went up there again and stayed for maybe two days before he died. But other fishes wondered about that world. And crawled up onto the muddy shore. And stayed. And taught themselves how to breathe the air. And taught themselves how to stand up, how to walk around, how to live with the sunlight in their eyes. And they turned into lizards, dinosaurs, whatever they became, and walked around for millions of years. Next they started to get up on their hind legs and use their hands to grab things. They turned into apes and the apes got smarter and became men. And all the time some of them, a few, anyway, kept looking for new worlds. You say to them, *Let's go back into the ocean—let's be fishes again, it's easier that way.* And maybe half of them are ready to do it—more than half, maybe—but there are always some who say, *Don't be crazy. We can't be fishes any more. We're men.* And so they don't go back. They keep climbing up.

September 20, 2218.

Simeon Krug's tower now rises a hundred meters above the gray-brown tundra of the Canadian Arctic, west of Hudson Bay. At present the tower is merely a glassy stump, hollow, open-topped, sealed from the elements only by a repellor field hovering shieldlike just a few meters above the current work level. Around the unfinished structure cluster the work crews, made up entirely of androids—thousands of synthetic humans who toil to affix glass blocks to scooprods and send the rods climbing to the summit, where other androids put the blocks in place. Krug has his androids working three shifts around the clock. When it gets dark, the construction site is lit by millions of reflector plates strung across the sky at a height of one kilometer and powered by the little million-kilo-

watt fusion generator at the north end of the site.

From the tower's huge octagonal base radiate wide silvery strips of refrigeration tape, embedded fifty centimeters deep in the frozen carpet of soil, roots, moss and lichens that is the tundra. The tapes stretch several kilometers in each direction. Their helium-II diffusion cells soak up the heat generated by the androids and vehicles used in building the tower. If the tapes were not there, the tundra would soon be transformed by the energy-output of construction into a lake of mud; the colossal tower's foundation-caissons would lose their grip, and the great building would tilt and tumble like a felled titan. The tapes keep the tundra icy, firm, capable of bearing the immense burden that Simeon Krug is now imposing on it.

Subsidiary buildings are centered on a thousand-meter radius around the tower. To the west of the site is the master control center. To the east is the laboratory where the tachyon-beam ultrawave communications equipment is being fabricated—a small pink dome which usually contains ten or a dozen technicians, patiently assembling the devices with which Krug hopes to send messages to the stars. North of the site is a clutter of miscellaneous service buildings. On the south side is the bank of transmat cubicles that link this remote region to the civilized world. People and androids flow constantly in and out of the transmats, arriving from New York or Nairobi or Novosibirsk, departing for Sydney or San Francisco or Shanghai.

Krug himself invariably visits the site at least once a day—alone or with his son Manuel. Or with one of his women, or some fellow industrialist. Customarily he confers with Thor Watchman, his android foreman; he rides a scooprod to the top of the tower and peers into it; he checks the progress in the tachyon-beam lab; he talks to a few of the workmen, his way of inspiring loftier effort. Generally Krug spends no more than fifteen minutes at the tower. Then he steps back into the transmat and is instantaneously hurled to the business that awaits him elsewhere.

TODAY he has brought a fairly large party, perhaps to celebrate the attainment of the 100-meter level. Krug stands near what will be the tower's western entrance. He is a stocky man of sixty, deeply tanned, heavy-chested and short-legged, with narrow-set, glossy eyes and a seamed nose. There is a peasant strength about him. His contempt for all cosmetic editing of the body is shown by his coarse features, his shaggy brows, his thinning hair—he is practically bald and will do nothing about it. Freckles show through the black strands that cross his scalp. He is

worth several billion dollars fissionable, though he dresses plainly and wears no jewelry. Only the infinite authority of his stance and expression indicate the extent of his wealth.

Nearby is his son and heir, Manuel, his only child, tall, slender, almost foppishly handsome, elegantly dressed in a loose green robe, high buskins, an auburn sash. He affects earlobe plugs and a mirror-plate in his forehead. He will shortly be thirty. His movements are graceful but he seems fidgety.

The android Thor Watchman stands between father and son. He is as tall as Manuel, as powerfully built as the elder Krug. His face is that of a standard alpha-class android, with a lean caucasoid nose, thin lips, strong chin, sharp cheekbones—an idealized face, a plastic face. Yet he has impressed a surprising individuality on that face from within. No one who sees Thor Watchman will mistake him the next time for some other android. A certain gathering of the brows, a certain tension of the lips, a certain hunching of the shoulders, mark him as an android of strength and purpose. He wears an openwork lace doublet. He is indifferent to the biting cold at the site and his skin, the deep red, faintly waxy skin of an android, is visible in many places.

There are seven others in the group that has emerged from the transmat. They are:

Clissa, the wife of Manuel Krug.

Quenelle, a woman younger than Manuel, who is his father's current companion.

Leon Spaulding, Krug's private secretary, an ectogene.

Niccolò Vargas, at whose observatory in Antarctica the first faint signals from an extrasolar civilization were detected.

Justin Maledetto, the architect of Krug's tower.

Senator Henry Fearon of Wyoming, a leading Witherer.

Thomas Buckleman of the Chase/Krug banking group.

"Into the scooprods, everybody," Krug bellows. "Here—here—you—you—up to the top!"

"How high will it be when it's finished?" Quenelle asks.

"Fifteen hundred meters," Krug replies. "A tremendous tower of glass, full of machinery that nobody can understand. And then we'll turn it on. And then we'll talk to the stars."

In the beginning there was Krug and He said, Let there be Vats, and there were Vats.

And Krug looked upon the Vats and found them good.

And Krug said, Let there be high-energy nucleotides in the Vats. And the nucleotides were poured and Krug mixed them until they were bonded one to another.

And the nucleotides formed the great molecules and Krug said, Let there be the father and the mother

both in the Vats and let the cells divide and let there be life brought forth upon the face of the Earth.

And there was life, for there was Replication.

And Krug presided over the Replication and touched the fluids with His own hands and gave them shape and essence.

Let man come forth from the Vats, said Krug, and let women come forth and let them live and go among us and be sturdy and useful and we shall call them Androids.

And so it came to pass.

And there were Androids, for Krug had created them in His own image and they walked upon the face of the Earth and did service for mankind.

And for these things, praise be to Krug.

WATCHMAN woke that morning in Stockholm. Groggy—four hours of sleep. Much too much. Two hours would suffice. He cleared his mind with a quick neural ritual and got under the shower for a skin-sluicing. Better, now. The android stretched, wriggled muscles, studied his smooth rosy hairless body in the bathroom mirror.

A moment for religion, next.

Krug deliver us from servitude. Krug deliver us from servitude. Krug deliver us from servitude. Praise be to Krug!

Watchman popped down his breakfast and dressed. The pale light of late afternoon touched his window. Soon it would be evening here—but no matter. The clock in his mind was set to Canadian time, tower time. He could sleep whenever he wished, as long as he took at least one hour out of twelve. Even an android body needed some rest, although not in the rigidly programed way of humans.

Off to the construction site, now, to greet the day's visitors.

The android began setting up the transmat coordinates. He hated these daily tour sessions. They slowed the work. Extraordinary precautions had to be observed while important human beings were on the site. They introduced special and unnecessary tensions and their presence carried the hidden implication that his work was not really trust-worthy, that he had to be checked every day. Of course, Watchman was aware that Krug's faith in him was limitless. The android's faith in that faith had sustained him superbly through the task of erecting the tower thus far. He knew that it was not suspicion but the natural human emotion of pride that brought Krug to the site so often.

Krug preserve me.

Watchman stepped through the transmat.

He strode out into the shadow of the tower. His aides greeted him. Someone handed him a list of the day's visitors.

"Is Krug here yet?"

"Five minutes," he was told and in five minutes Krug came through the transmat, accompanied by his guests.

Watchman was not cheered to see Krug's secretary, Spaulding, in the group. He and Spaulding were natural enemies—they felt toward one another the instant antipathy of the vat-born and the bottle-born, the android and the ectogene. But aside from that they were rivals for eminence among Krug's associates. To the android, Spaulding was a spreader of suspicions, a potential underminer of his status, a fount of poisons. Watchman greeted him cooly, distantly, yet properly. One did not snub humans, no matter how important an android one might be. And at least by technical definition Spaulding had to be considered human.

Krug was hustling everybody into scooprods. Watchman went up with Manuel and Clissa Krug. As the rods rode toward the truncated summit of the tower, Watchman glanced across at Spaulding in the rod to his left and glowered at the ectogene, the prenatal orphan, the man of cramped soul and baleful spirit in whom Krug perversely placed so much trust.

May Arctic winds sweep you to destruction, bottle-born. May I see you float sweetly toward the frozen ground and break beyond repair . . .

Spaulding took no notice.

Clissa Krug asked, "Thor, why do you suddenly look so fierce?"

"Do I?"

"I see angry clouds crossing your face."

Watchman shrugged.

"I'm doing my emotion drills, Mrs. Krug. Ten minutes of love, ten minutes of hate, ten minutes of shyness, ten minutes of selfishness, ten minutes of awe, ten minutes of arrogance. An hour a day makes androids more like people."

"Don't tease me," Clissa said. She was very young, slim, dark-eyed, gentle and, Watchman supposed, beautiful. "Are you telling me the truth?"

"I am. Really. I was practicing a little hatred when you caught me."

"What's the drill like? I mean, do you just stand there thinking Hatehatehatehatehate, or what?"

He smiled at the girl's suggestion. Looking over her shoulder, he saw Manuel wink at him.

"Another time," Watchman said. "We're at the top."

THE three scooprods clung to the highest course of the tower. Just above Watchman's head hung the gray haze of the repellor field. The sky, too, was gray. The short northern day was nearly half over. A snowstorm was heading southward toward them along the shore of the bay. Krug, in the next scooprod, was leaning far into the tower,

pointing out something to Buckleman and Vargas. In the other rod Spaulding, Senator Fearon and Maledetto were closely examining the satiny texture of the great glass bricks that made up the tower's outer skin.

"When will it all be finished?" Clissa asked.

"Less than a year," the android told her. "We're moving along nicely. The big technical problem was keeping the permafrost under the building from thawing. But now that that's behind us, we ought to be rising several hundred meters a month."

"Why build here in the first place," she wanted to know, "if the ground wasn't stable?"

"Isolation. When the ultrawave is turned on, it'll scramble all communications lines, transmats and power generators for thousands of square kilometers. Krug was pretty well limited to putting the tower in the Sahara, the Gobi, the Australian desert or the tundra. For technical reasons—having to do with transmission—the tundra seemed most desirable, provided the thawing problem could be beaten. Krug told us to build here. So we found a way to beat the thawing problem."

Manuel asked, "What's the status of the transmission equipment?"

"We begin installing it when the tower's at the five-hundred-meter level. Say, mid-November."

Krug's voice boomed across to them. "We've already got the five satellite amplifying stations up. A ring of power sources surrounding the tower—enough boost to kick our signal clear to Andromeda between Tuesday and Friday."

"A wonderful project," said Senator Fearon. He was a dapper, showy-looking man with startling green eyes and a mane of red hair. "Another mighty step toward the maturity of mankind." With a courtly nod toward Watchman the Senator added: "Of course, we must recognize our immense debt to the skilled androids who are bringing this miraculous project to fruition. Without the aid of you and your people, Alpha Watchman, it would not have been possible to—"

Watchman listened blankly, remembering to smile. Compliments of this sort meant little to him. The World Congress and its Senators meant even less. Was there an android in the Congress? Would it make any difference if there were? Some day, no doubt, the Android Equality Party would get a few of its people into the Congress—three or four alphas would sit in that august body and, nevertheless, androids would continue to be property, not people. The political process did not inspire optimism in Thor Watchman.

His own politics, such as they were, were definitely Witherer—in a transmat society, where na-

tional boundaries are obsolete, why have a formal government at all? Let the legislators abolish themselves. Let natural law prevail. But he knew that the withering away of the state that the Witherers preached would never come to pass. The proof of it was Senator Henry Fearon. The ultimate paradox: a member of the anti-government party serving in the government himself and fighting to hold his seat at every election. What price Withering, Senator?

Fearon praised android industriousness at length. Watchman fretted. No work was getting done while they were up here—he didn't dare let blocks be hoisted with visitors in the construction zone. And he had schedules to keep. To his relief, Krug soon signaled for a descent; the rising wind, it seemed, was bothering Quenelle.

When they came down Watchman led the way over to the master control center, inviting them to watch him take command of operations. He slipped into the linkup seat. As he pushed the computer's stub-tipped terminal node into the input jack on his left forearm the android saw Leon Spaulding's lips tighten in a scowl of—what? Contempt, envy, patronizing scorn? For all his skill with humans, Watchman could not read such dark looks with true precision. But then, at the click of contact, the computer impulses came flooding across the interface into his brain and he forgot about Spaulding.

It was like having a thousand eyes. He saw everything going on at the site and for many kilometers around the site. He was in total communion with the computer, making use of all of its sensors, scanners and terminals. Why go through the tedious routine of talking to a computer when it was possible to design an android capable of becoming part of one?

The data torrent brought a surge of ecstasy.

Maintenance charts. Work-flow syntheses. Labor coordination systems. Refrigeration levels. Power-shunt decisions. The tower was a tapestry of infinite detail and he was the master weaver. Everything rushed through him; he approved, rejected, altered, canceled. Was sex something like this? That tingle of aliveness in every nerve, that sense of being extended to one's limits, of absorbing an avalanche of stimuli? Watchman wished he knew. He raised and lowered scooprods, requisitioned next week's blocks, ordered filaments for the tachyon-beam men, looked after tomorrow's meals, ran a constant stability check on the structure as completed, fed cost data to Krug's financial people, monitored soil temperature in fifty-centimeter gradations to a depth of two kilometers, relayed scores of telephone messages per second and congratulated himself on the

dexterity with which he accomplished everything. No human could handle this, he knew, even if there were some way for humans to jack themselves directly into a computer, He had a machine's skills and a human's versatility and therefore, except for the fairly serious matter of being unable to reproduce himself, he was in many ways superior to both other classes and therefore—

The red arrow of an alarm cut across his consciousness.

Construction accident. Android blood spilling on the frozen ground.

A twitch of his mind gave him close focus. A scooprod had failed on the northern face. A glass block had fallen from the ninety-meter level. It lay slightly skewed, one end buried about a meter deep in the earth, the other slightly above ground level. A fissure ran like a line of frost through its clear depths. Legs stuck out from the side closest to the tower. A few meters away lay an injured android, writhing desperately. Three lift-beetles were scurrying toward the scene of the accident; a fourth had already arrived and had its steel prongs under the massive block.

Watchman unjacked himself. He shivered in the first moment of the pain of separation from the data flow. A wallscreen over his head showed the accident vividly. Clissa Krug had turned away, head against her husband's breast —Manuel looked sickened, his father irritated. The other visitors seemed more puzzled than disturbed. Watchman found himself peering into Leon Spaulding's icy face. Spaulding was a small, pared-down man, all but fleshless. In the curious clarity of his shock Watchman was aware of the widely separated hairs of the ectogene's stiff black mustache.

"Coordination failure," Watchman said crisply. "The computer seems to have misread a stress function and let a block drop."

"You were overriding the computer at that moment, weren't you?" Spaulding asked. "Let's put the blame where blame belongs."

The android would not play that game.

"Excuse me," he said. "There have been injuries and probably fatalities. I must go."

He hurried toward the door.

"—inexcusable carelessness—" Spaulding muttered.

Watchman went out. As he sprinted toward the accident site he began to pray.

II

"NEW YORK," Krug said. "The upper office."

He and Spaulding entered the transmat cubicle. The lambent green transmat field pulsed up from the floor aperture, forming a curtain dividing the cubicle in two.

The ectogene set the coordinates. The hidden power generators of the transmat were linked directly to the main generator, spinning endlessly on its poles somewhere beneath the Atlantic, condensing the theta force that made transmat travel possible. Krug did not bother to check the coordinates Spaulding had set. He trusted his staff. A minor abscissa distortion and the atoms of Simeon Krug would be scattered irrecoverably to the cold winds—but he unhesitatingly stepped into the glow of green.

There was no sensation. Krug was destroyed—a stream of tagged wavicles was hurled several thousand kilometers to a tuned receiver and Krug was reconstituted. The transmat field ripped a man's body into subatomic units so swiftly that no neural system could possibly register the pain and the restoration to life came with equal speed. Whole and undamaged, Krug emerged—with Spaulding still beside him—in the transmat cubicle of his office.

"Look after Quenelle," Krug said. "She'll be arriving downstairs. Amuse her. I don't want to be disturbed for at least an hour."

Spaulding exited. Krug closed his eyes.

The falling of the block had upset him greatly. It was not the first accident during the building of the tower—it probably would not be the last. Lives had been lost today—only android lives, true, but lives all the same. The waste of life, the waste of energy, the waste of time, infuriated him. How would the tower rise if blocks fell? How would he send word across the heavens that man existed, that he mattered, if there were no tower? How would he ask questions that had to be asked?

Krug ached. Krug felt close to despair at the immensity of his self-imposed task.

In time of fatigue or tension he became morbidly conscious of the presence of his body as a prison engulfing his soul. The folds of belly-flesh, the island of perpetual rigidity at the base of the neck, the tiny tremor of the upper left eyelid, the slight constant pressure on the bladder, the rawness in the throat, the bubbling in the kneecap, every intimation of mortality rang in him like a chime. His body often seemed absurd to him, a mere bag of meat and bone and blood and feces and miscellaneous ropes and cords and rags, sagging under time's assault, deteriorating from year to year and from hour to hour. What was noble about such a mound of protoplasm? The preposterousness of fingernails! The idiocy of nostrils! The foolishness of elbows! Yet under the armored skull ticked the watchful gray brain, like a bomb buried in mud. Krug scorned his flesh but he felt only awe for his brain and for the human brain in the abstract. The true Krugness of him was in that

soft folded mass of tissue, nowhere else—not in the guts, not in the groin, not in the chest—but in the mind. The body rotted while its owner still wore it. The mind within soared to the farthest galaxies.

"Massage," Krug said.

The timber and tone of his command caused a smoothly vibrating table to extrude itself from the wall. Three female androids, kept constantly on call, entered the room. Their supple bodies were bare. They were standard gamma models, who could have been triplets but for the usual programed minor somatotype divergences. They had small high-set breasts, flat bellies, narrow waists, flaring hips, full buttocks. They had hair on their heads and they had eyebrows but otherwise they were without body hair, which gave them a certain sexless look—yet the groove of sex was inscribed between their legs and Krug, if his tastes inclined that way, could part those legs and find within them a reasonable imitation of passion. His tastes had never inclined that way. But Krug had deliberately designed an element of sensuality into his androids. He had given them functional—if sterile—genitals, just as he had given them proper—though needless—navels. He wanted his creations to look human—aside from the necessary modifications—and to do most human things. His androids were not robots. He had chosen to create synthetic humans, not mere machines.

THE three gammas efficiently stripped him and worked him over with their cunning fingers. Krug lay belly down. Tirelessly they plucked at his flesh and toned his muscles. He stared across the emptiness of his office at the images on the distant wall.

The room was furnished simply, even starkly—a lengthy rectangle that contained a desk, a data terminal, a small somber sculpture and a dark drape that would, at the touch of a repolarizing stud, reveal the panorama of New York City far below. The lighting, indirect and subdued, kept the office in eternal twilight. On one wall, though, there blazed a pattern in brilliant yellow luminescence:

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It was the message from the stars.

Vargas' observatory had picked it up first as a series of faint radio pulses at ninety-one hundred megacycles: two quick beats, a pause, four beats, a pause, one beat—and so on. The pattern was repeated a thousand times over a span of two

days, then halted. A month later it showed up at fourteen hundred and twenty-one megacycles, the twenty-one-centimeter hydrogen frequency, for another thousand turns. A month after that it came in both at half and at double that frequency, a thousand of each. Still later, Vargas was able to detect it optically, riding in on an intense laser beam at a five thousand-angstrom wavelength. The pattern was always the same, clusters of brief bursts of information: 2 . . . 4 . . . 1 . . . 2 . . . 5 . . . 1 . . . 3 . . . 1. Each subcomponent of the series was separated from the next by an appreciable gap, and there was a much larger gap between each repetition of the entire group of pulse clusters.

Surely it was some message. To Krug, the sequence 2-4-1-2-5-1-3-1 had become a sacred number, the opening symbols of a new kabbala. Not only was the pattern emblazoned on his wall but the touch of his finger would send the sound of the alien signal whispering through the room in any of several audible frequencies and the sculpture beside his desk was primed to emit the sequence in brilliant flashes of coherent light.

The signal obsessed him. His universe now revolved about the quest to make reply. At night he stood beneath the stars, dizzied by the cascade of light, and opened his arms to the galaxies, saying, *I am Krug, I am Krug, here I wait, speak to me again!* He admitted no possibility that the signal from the stars might be other than a consciously directed communication. He had turned all of his considerable assets to answering.

—But isn't there any chance that the "message" might be some natural phenomenon?

None. The persistence with which it arrived in such a variety of media indicates a guiding consciousness behind it. Someone is trying to tell us something.

—What significance do those numbers have? Are they some kind of galactic pi?

We see no obvious mathematical relevance. They do not form any apparent intelligible arithmetical progression. Cryptographers have supplied us with at least fifty equally ingenious suggestions, which makes all fifty equally suspect. We think that the numbers were chosen entirely at random.

—What good is a message that doesn't have any comprehensible content?

The message is its own content: a yodel across the galaxies. It tells us, Look, we are here, we know how to transmit, we are capable of rational thinking, we seek contact with you!

—Assuming you're right, what kind of reply do you plan to make?

I plan to say, Hello, hello, we hear you, we detect your message, we send greetings, we are intelli-

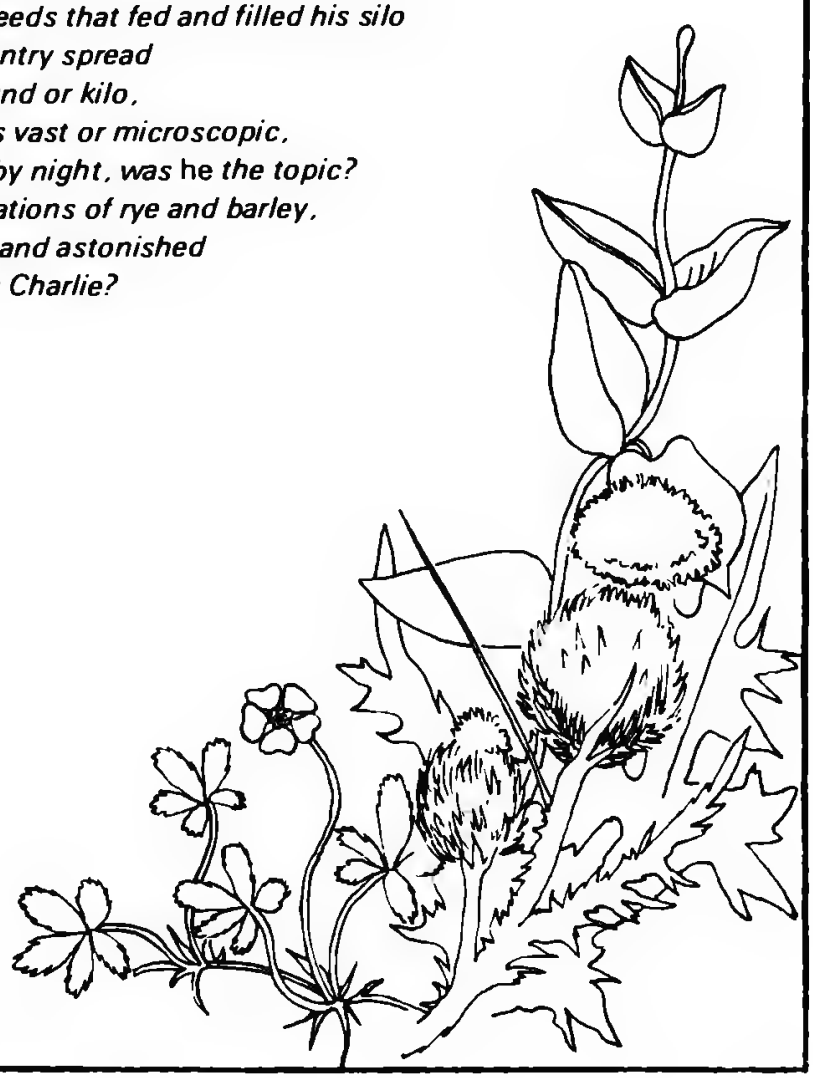
(Please turn to page 119)

DARWIN IN THE FIELDS

Three poems celebrating the Peculiar Talents of one Charles Darwin who loitered about Outdoors, always in hopes that Nature might Do Something.

RAY BRADBURY

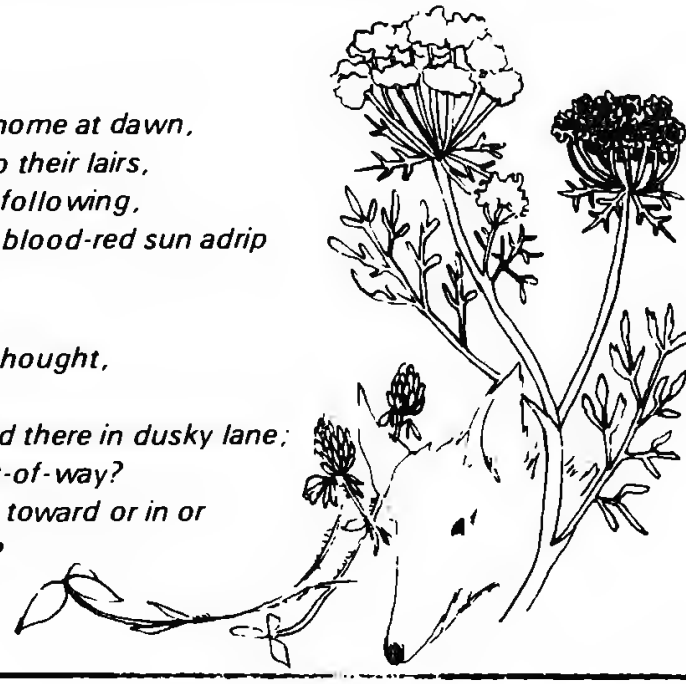
Old Curious Charlie
He stood for hours
Benumbed,
Astonished
Amid the flowers;
Waiting for silence,
Waiting for motions
In seas of rye
Or oceans of weeds—
The stuff on which true astonishment feeds—
And the weeds that fed and filled his silo
With a country spread
By the pound or kilo,
Of miracles vast or microscopic,
For them, by night, was he *the topic?*
In conversations of rye and barley,
Did they *stand astonished*
By Curious Charlie?



Darwin, in the fields, stood still as time
And waited for the world to now exhale and now
Take in a breath of wind from off the yield and swell
Of sea where fill the clouds with sighs;
His eyes knew what they saw but took their time to tell
This truth to him; he waited on their favor.
His nose kept worlds far larger than a goodly nose might savor
And waited for the proper place to fit the flavor in.
So eye and nose and ear and hand told mouth
What it must say;
And after awhile and many and many a day
His mouth,
So full of Nature's gifts, it trembled to express,
Began to move.
No more a statue in the field,
A honeybee come home to fill the comb,
Here Darwin hies.
Though to ordinary eyes it might appear he plods,
Victorian statue in a misty lane;
All that is lies. Listen to the gods:
"The man flies, I tell you. The man flies!"

Darwin, wandering home at dawn,
Met foxes trotting to their lairs,
Their tattered litters following,
The first light of the blood-red sun adrip
among their hairs.

What must they've thought,
The man of fox,
The fox of man found there in dusky lane;
And which had right-of-way?
Did he or they move toward or in or
on away from night?



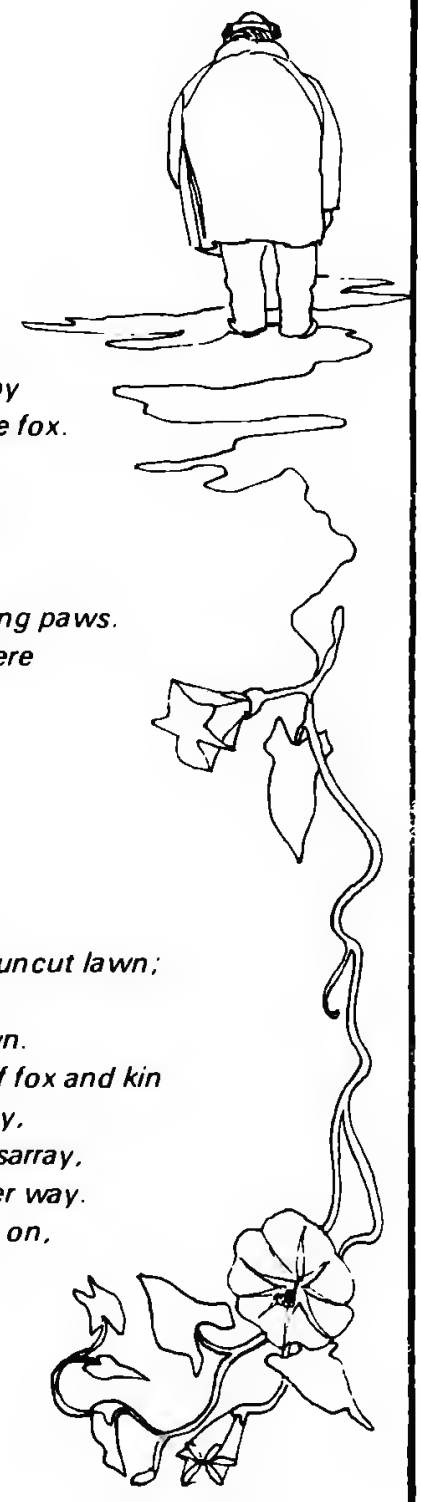
Their probing eyes
And his
Put weights to hidden scales
In mutual assize,
In simple search all stunned
And amiable apprize.

Darwin, the rummage collector,
Longing for wisdom to clap in a box,
Such lore as already learned and put by
A billion years back in his blood by the fox.

Old summer days now gone to flies
Bestir themselves alert in vixen eyes;
Some primal cause
Twitches the old man's human-seeming paws.
An ancient sharp surmise is melded here
And shapes all Dooms
Which look on Death and know it.

Darwin all this knows.
The fox knows he knows.
But knowing is wise not to show it.

They stand a moment more upon the uncut lawn;
Then as if by sign, quit watchfulness;
Each imitates the other's careless yawn.
And with no wave save pluming tail of fox and kin
Away the creatures go to sleep the day,
Leaving old Charlie there in curious disarray,
His hair combed this, his wits the other way.
So off he ambles, walks, and wanders on,
Leaving an empty meadow,
A place
Where strange lives passed. . .
And dawn.



A. BERTRAM CHANDLER

Can anything be more terrifying than realizing all your dreams?

THE RUB

I

SLOWLY GRIMES awakened from his nightmare.

It had been so real—too real—and the worst part was always the deep sense of loss. There was that shocking contrast between the dreary life that he was living (in the dream) and the rich and full life that he somehow knew that he should be living. There was his wife—that drab, unimaginative woman with her irritating mannerisms—and that memory of someone else, someone he had never met, never would meet, someone elegant and slim, someone with

whom he had far more in common than simply the physical side of marriage—someone who knew books and music and the visual arts and yet evinced a deep appreciation of the peculiar psychology of the spaceman.

Slowly Grimes resumed full awareness.

Slowly he realized that he was not in his bedroom in the Base Commander's quarters on Zetland. He listened to the small, comforting noises—the irregular throbbing of the inertial drive, the sobbing of pumps, the soughing of the ventilation system, the thin, high whine of the Mannschenn Drive unit. And he heard the soft, steady breathing of the woman in the bed with him (that other one snored).

But—such was the impression his dream had made upon him—he had to be sure. All cats are gray in the dark. Without too much fumbling he found the stud of the light switch on his side of the bed. His reading lamp came on. Its glow was soft, subdued—but it was enough to wake Sonya.

She looked up at him irritably, her lean face framed by the auburn hair that somehow retained its neatness, its sleekness, even after sleep.

She demanded sharply, "What is it, John?"

He said, "I'm sorry. Sorry I woke you, that is. But I had to be sure."

Her face and voice immediately softened.

"That dream of yours again?"

"Yes. The worst part of it is knowing that you are somewhere—somewhen—but that I shall never meet you."

"But you did." She laughed with him, not at him. "And that's your bad luck."

"My good luck," he corrected.

"Our good luck."

"I suppose we could have done worse," he admitted.

GRIMES was awakened again by the soft chiming of the alarm. From his side of the bed he could reach the service hatch in the bulkhead. He opened it, revealing the tray with its silver coffee service.

"The usual?" he asked Sonya, who was making a lazy attempt to sit up in bed.

"Yes, John. You should know by this time."

Grimes poured a cup for his wife—black, unsweetened—then one for himself. He liked sugar, rather too much of it, and cream.

"I shall be rather sorry when this voyage is over," said Sonya. "Jimmy is doing us well. We shouldn't be pampered like this in an Alpha Class liner."

"After all, I am a commodore," said Grimes smugly.

"Not in the Survey Service, you aren't," Sonya told him.

In that dream, that recurring nightmare, I'm still an officer in

the Federation's Survey Service. But I've never got past commander. I've passed my days and will end my days as commanding officer of an unimportant base on a world that somebody had once described as a planetwide lower middle-class suburb.

"Perhaps not," Grimes admitted. "But I pile on enough Gees to be accorded V.I.P. treatment aboard a Survey Service ship."

"You do? I was under the impression that it was because of me that Jimmy let us have the V.I.P. suite."

"Not you. You're a mere commander and on the Reserve List at that."

"Don't be so bloody rank conscious—"

She took a swipe at him with her pillow. Grimes cursed as hot coffee splashed on his bare chest.

Then: "I don't know what your precious Jimmy will think when he sees the mess on the sheets."

"He'll not see it—and his laundrobot won't worry about it. Pour yourself some more coffee. I'll use the bathroom while you're drinking it." Then, as she slid out of the bed; "And go easy on the sugar. You're getting a paunch."

I remember the fat and slovenly Commander of Zetland Base . . .

COMMANDER JAMES FARRELL, captain of *Star Pioneer*, prided himself on running a taut ship. Attendance at every meal was mandatory for his officers. As he and Sonya took their seats at the captain's table, Grimes wondered how Farrell would cope with the reluctance of Middle Watch keepers aboard merchant vessels to appear at breakfast.

All the *Star Pioneer's* officers were here, in their places, except for those actually on duty. Smartly uniformed messgirls circulated among the tables, taking orders, bringing dishes. Farrell sat, of course, at the head of his own table, Sonya to his right and Grimes to his left. At the foot of the table was Lieutenant Commander Malleson, the senior engineering officer. There was little to distinguish him from his captain but the badges of rank. There was little to distinguish any of the officers, one from the other. All were tall young men with close-cropped hair, standardized good looks, each and every one of them a refugee from a Survey Service recruiting poster.

In my young days we had room for individuality ... Grimes smiled to himself. *And where did it get me? Oh, you bloody tee, that's where . . .*

"What's the joke, John?" asked Sonya. "Share it, please."

Grimes' prominent ears reddened.

"Just a thought, dear." He was saved by a messgirl, who presented the menu to him. "Nathia-juice, please. Ham and eggs—sunny side up—to follow, with just a hint of

French fries. And some coffee."

"You keep a good table, Jimmy," Sonya said to Farrell. Then, looking at her husband: "Rather too good, perhaps."

"I'm afraid, Sonya," Farrell told her, "that our meals from now on will be lacking in variety. It seems that our Esquelian passengers brought aboard some local virus. The biologists in the first survey expeditions found nothing at all on Esquel in any way dangerous to human life, so perhaps we didn't take the precautions we should have when we embarked the King and his followers. Even so, while they were on board their excretory matter was excluded from the ship's closed ecology. But after they were disembarked on Tallis the plumbing wasn't properly disinfected—"

Not a very suitable topic of conversation for the breakfast table . . .

Grimes sipped his fruit juice.

"So?" asked Sonya interestedly.

"So there's been a plague running its course in the "farm." Only the tissue culture vats have been affected, luckily. We could make do indefinitely on yeasts and algae—but who wants to?" He grinned at Grimes, who was lifting a forkload of yolk-coated ham to his mouth. "Who wants to?"

"Not me, Captain," admitted Grimes.

"Or me, Commodore. The beef's dead—and the pork and the chicken. The quack says that the lamb's not fit for human consumption. So far the mutton seems to be unaffected—but we can't be sure even of that."

"You'll be able to stock up when we get to Port Forlorn," said Grimes.

"That's a long way off." Farrell looked steadily at Grimes as he buttered a piece of toast. "I've a job for you, Commodore."

"A job for me, Commander Farrell?"

"Yes, you, Commodore Grimes. By virtue of your rank you represent the Rim Worlds Confederacy aboard this vessel. Kinsolving's Planet, although no longer colonized, is one of the Rim Worlds. I want to put down there."

"Why?" asked Grimes.

"Correct me if I'm wrong. Commodore, but I understand that the original settlers introduced Earth-type flora and fauna, some of which have not only survived but flourished. I'm not interested in the flora, of course—but I've heard that there are the descendants of the original rabbits, pigs, cattle and hens running wild there."

"No cattle," Grimes told him. "And no hens. Probably the pigs did for them before they could become established."

"Rabbit's a good substitute for chicken," said Farrell.

"Jimmy," reproved Sonya, "I do believe that you like your tummy."

"I do, Sonya, I do," said the young man.

"And so do I," said Lieutenant Commander Malleson, who until now had been eating in dedicated silence.

"But I don't like Kinsolving," grumbled Grimes. "And, in any case, we shall have to get permission to land."

"You will get it, John," said Sonya firmly.

LATER that ship's morning Farrell discussed the proposed landing on Kinsolving with Grimes and Sonya.

"Frankly," he told them, "I'm glad of an excuse to visit the planet. Not so long ago the Survey Service released a report on the three expeditions, starting off with that odd wet paint affair—"

"That was over a hundred and fifty years ago," said Grimes.

"Yes. I know. And I know, too, that you've been twice to Kinsolving—the first time as an observer with the Neo-Calvinists, the second time in command of your own show."

"And both times," admitted Grimes, "I was scared. Badly."

"You don't frighten easily, Commodore, as well I know. But what actually did happen? The official reports that have been released to the likes of us don't give much away. It was hinted—merely hinted—that the Neo-Calvinists tried to call up the God of the Old Testament and raised the entire Greek Pantheon instead. And you, sir, attempted to repeat the experiment—and got tangled with a Mephistopheles straight out of Gounod's *Faust*."

"Cutting extraneous cackle," said Grimes, "that's just what did happen."

"What I'm getting at, Commodore, is this. Were your experiences objective or subjective?"

"During my first visit, Commander, the Neo-Calvinist's ship, *Piety*, was destroyed, as were her pinnaces. Their leaders—the Presbyter, the Rector, the Deaconess and thirteen others, men and women—completely vanished. That was objective enough for anybody. The second time—I vanished."

"I can vouch for that," stated Sonya.

"But you came back. Obviously."

"More by luck than judgment." Grimes laughed without humor. "When you do a deal with the devil it's as well to read the small print."

"But at no time was any actual physical harm done to anybody."

"Some could have been. And we don't know what happened to the Neo-Calvinist boss cockies—"

"They're probably being converted to hedonism on Mount Olympus," said Sonya.

"But we don't actually know."

Farrell grinned.

"And aren't those very words a

challenge to any officer in the Survey Service? You used to be one of us yourself, sir, and Sonya is still on our Reserve List. Kinsolving is almost directly on the track from Tallis to Lorn. I have a perfectly valid excuse to make a landing. And even in these decadent days —" his smile widened—"my Lords Commissioners do not discourage initiative and zeal on the part of their captains."

Grimes grinned back reluctantly. It was becoming evident that Farrell possessed depths of character not apparent on first acquaintance. True, he worked by the book —and had Grimes done so he would have risen to the rank of Admiral in the Survey Service—but he was also capable of reading between lines. A deviation from his original cruise pattern—the evacuation of the King and his supporters From Esquel—had brought him to within easy reach of Kinsolving and he was making the most of the new circumstances. Fleetingly Grimes wondered if the destruction of the ship's meat supply had been intentional rather than accidental—he dismissed the thought. Not even he, Grimes, had ever done a thing like that.

"Later," said Farrell, "if it's all right with you, sir, we'll go over the official reports and you can fill in the gaps. But what makes Kinsolving the way it is?"

"Your guess is as good as anybody's, Commander. The atmosphere is—odd. Psychologically odd, not chemically or physically. A terrifying queerness. One senses impending doom. Kinsolving was settled at the same time as the other Rim Worlds. It's a far more ecologically desirable piece of real estate than any of them. But the colonists lost heart. Their suicide rate rose to an abnormal level. Their mental institutions were soon overcrowded. And so on. So they pulled out. I've heard many theories. One of the latest is that the Kinsolving system lies at some intersection of stress lines. Stress lines in what? Don't ask me. But the very fabric of the Continuum is thin, ragged, and the dividing lines between Then and Now, Here and There, What Is and What Might Be are virtually nonexistent—"

"Quite a place," commented Farrell. "But you're willing to visit it a third time, sir?"

"Yes," agreed Grimes after a long pause. "But I'm not prepared to make a third attempt at awakening ancient deities from their well-earned rest. In any case, we lack the—I suppose you could call her the medium. She's on Lorn and even if she were here I doubt she'd play."

"Good. I'll adjust trajectory for Kinsolving and we'll send Carlottigrams to our respective lords and masters requesting permission to land. I don't think they'll turn it down."

"Unfortunately," said Grimes.

But the faint smile that lightened his craggy features belied the word.

FARRELL cautiously eased *Star Pioneer* down to the sunlit hemisphere of Kinsolving, to a position a little to the west of the morning terminator. Grimes had advised a landing at the site used by the Confederacy's *Rim Sword* and later by his own *Faraway Quest*. The destruction of the Neo-Calvinists' *Piety* had made the spaceport unusable. This landing place was hard by the deserted city of Enderston, on the shore of the Darkling Tarn. It had been the sports stadium.

Conditions were ideal for the landing. The sounding rockets, fired when the ship was descending through the first tenuous fringes of the atmosphere, had revealed a remarkable absence of turbulence. The parachute flares discharged by them at varying altitudes were falling straight down, each trailing its long, unwavering streamer of white smoke.

Grimes and Sonya were in the Control Room.

"There's Enderston," the Commodore said, "on the east bank of the Weary River. We can't see much from this altitude—everything's overgrown. That's the Darkling Tarn." He pointed to the amoebalike glimmer of water among the dull green that now was showing up clearly on the big approach screen. "You can't miss it. That oval of paler green is the stadium—"

The Inertial Drive throbbed more loudly as Farrell made minor adjustments. When the stadium was in the exact center of the screen it settled down again to its almost inaudible muttering.

At Farrell's curt order they all went to their acceleration chairs, strapped themselves in. Grimes, with the others, watched the expanding picture on the screen. To him the scene was familiar, too familiar, even to the minor brush fire started by the last of the parachute flares. And as during his two previous landings he had the feeling that supernatural forces were mustering to resist the landing of the ship, to destroy her and all aboard her.

He looked at Farrell. The young captain's face was pale, strained. Grimes felt less unhappy. *Now you begin to know what it's like, Jimmy boy.*

She was down at last.

There was almost no shock at all and only an almost inaudible complaint from the ship's structure, a faint sighing of shock absorbers as the great mass of the vessel settled in the cradle of her tripedal landing gear.

"Secure main engines," ordered Farrell.

Telegraph bells jangled sharply. The Inertial Drive generators mut-

tered to themselves and were still. The silence was intensified by the soft soughing of the ventilation fans.

Grimes swiveled in his chair, gazed out through the viewport toward the distant mountain peak, the black, truncated cone hard and sharp against the pale blue sky. Sinai, Presbyter Cannon had named it. Olympus, Grimes had labeled it on his new charts of the planetary surface. But neither name was apt. On this mountain's summit the Neo-Calvinists had attempted to invoke Jehovah—and Zeus had answered their call. Grimes had tried to invoke the the gods of the Greek Pantheon—and had been snatched into an oddly peopled Limbo by Mephistopheles himself.

This time on Kinsolving the Commodore was going to be cautious. Wild horses—assuming any existed on this planet and assuming that they should be possessed by such a strange ambition—would not be able to drag him up to the top of that mountain.

NONETHELESS, Grimes did revisit the mountaintop, taken there by the tamed horsepower of *Star Pioneer's* pinnace rather than by wild horses. Nothing happened. Nothing could happen unless Clarisse, descendant of the long-dead artist-magicians, were there to make it happen. There was nothing to see except the view. All that remained of the two disastrous experiments was a weathered spattering of pigments where the witch-girl's easel had stood.

Everybody visited the famous caves, of course, and stared at and photographed the rock paintings, the startlingly lifelike depiction of beasts and their hunters. The paintings were old, old, even though some faint hint of their original magic still lingered.

But this was an uneasy world. Men and women never walked alone, were always conscious of something lurking in the greenery, in the ruins. Farrell, reluctant as he was to break the Survey Service's uniform regulations, issued strict orders that everybody ashore on any business whatsoever was to wear a bright, scarlet jacket over his other clothing. This was after two hunting parties had opened fire upon each other—luckily nobody was killed but four men and three women would be in the sick bay for days with bullet wounds.

Grimes said to Farrell, "Don't you think it's time that we were lifting ship, Captain?"

"Not for a while, Commodore. We have to be sure that the new tissue cultures will be successful."

"That's just an excuse."

"All right, it's just an excuse."

"You're waiting for something to happen."

"Yes. Damn it all, Commodore, this sensation of brooding menace is getting me down, it's getting all

of us down. But I want to have something definite to report to my Lords Commissioners."

"Don't pay too high a price for that fourth ring on your sleeve, James."

"It's more than promotion that's at stake, sir—although I shall welcome it. I hate being up against an enemy I can't see, can't touch. I want to accomplish something for its own sake. I don't want to slink away from here like a dog with his tail between his legs."

"The original colony did just that."

"But they—" Farrell stopped abruptly.

"I'll finish it for you, James. But they were mere civilians. They weren't wearing the Survey Service badge on their caps, Survey Service braid on their sleeves or shoulders. They weren't disciplined. And how long do you think your ship's discipline is going to stand up to the strain, gold braid and brass buttons notwithstanding?"

"Long enough."

Sonya broke in: "This is Jimmy's show, John. He makes the decisions. And I agree with him that we should stay on Kinsolving until we have something to show for our visit."

"Thank you, Sonya," said Farrell. Then: "You must excuse me. I have matters to attend to."

When the young man had left their cabin Sonya spoke softly.

"You're getting too old and cautious, John. Or are you sulking because you're not running things?"

"I don't like this world, my dear. I've reasons not to."

"You're letting it get you down. You look as though you hadn't slept for a week."

"I haven't. Not to speak of."

"Why didn't you let me know?"

"It's so damned silly. It's that bloody nightmare of mine—you know the one. It recurs every time I shut my eyes."

"You should have told me."

"I should have." He got slowly to his feet. "Probably some good, healthy exercise will make me sleep better. A long walk?"

"I'll come with you."

She fetched the scarlet jackets from the wardrobe. Grimes took his deadly little Minetti from a drawer, put it into one pocket, a spare clip of cartridges in the other. Heavier handguns and miniaturized transceivers they would collect from the duty officer at the airlock.

Within a few minutes they were walking down the ramp to the path that had been hacked and burned and trodden through the encroaching greenery, the trail that led to the ruined city.

II

IT WAS early afternoon. The sun was still high in the pale sky

but the breeze, what there was of it, was chilly. And the shadows, surely, were darker here than on any other world Grimes had every visited—They seemed to possess a life of their own. But that was only imagination.

They walked steadily but carefully, watching where they put their feet, avoiding the vines and brambles that seemed deliberately to try to trip them. On either side of the rough track the vegetation was locked in silent, bitter warfare—indigenous trees and shrubs, importations from Earth and other worlds and parasites upon parasites. In spite of the overly luxuriant growth the overwhelming impression was of death rather than of life. The most readily identifiable scent on the chill air was that of decay.

They came to the outskirts of the city, picking their way over tilted slabs of concrete, thrust up and aside by root and trunk, that had once been a road. Once the buildings between which it ran had been drably utilitarian—now a madly proliferating and destructive ivy clothed them in somber, Gothic splendor. An abandoned ground car, the glass of its headlights by some freak of circumstance unobscured, glared at them like a crouching, green-furred beast.

Grimes tried to imagine what this place had been like before its evacuation. Probably it had been very similar to any sizable town on Lorn or Faraway, Ultimo or Thule—architecturally. But one important difference had existed. The city had been dominated by an uncanny atmosphere, an omnipresent premonition of—what? Some fear of the cold and the dark, of ultimate night. Other cities on other worlds had their haunted houses—here the very stones had been haunted.

He said, "The sooner young Farrell lifts ship off this deserted graveyard, the better."

"At least it's not raining," Sonya told him, with an attempt at cheerfulness.

"Thank the odd gods of the Galaxy for one small mercy," grumbled Grimes.

"Talking of odd gods—"

"What about them?"

"Sally Veerhausen, the biochemist, told me there's a very odd church on a side street that runs off the main drag."

"Oh?"

"Yes. It's to the right—in an alley you turn into just before you get to a tall tower with a latticework radio mast still standing on top of it."

"Is that it there? To the right?"

"Must be. Shall we investigate?"

"What is there to investigate?"

"Nothing, probably. But I seem to recall a period when you exhibited a passion for what you referred to as freak religions. This could be one to add to your collection."

"I doubt it."

But after a few minutes' careful walking they were turning off the main street, making their way along an alley between walls overgrown with the ubiquitous ivy that had been brought to the world by some long-dead, home-sick colonist.

THE church was there.

It was a small building, a masonry cube, its angles somehow and subtly wrong. And it was different from its neighbors. Perhaps the stone, natural or synthetic, from which it had been constructed possessed some quality, physical or chemical, lacking in the building materials in more general use. Its dull gray facade was unmarked by creeper, lichen or moss. Its door, as gray as the walls but of metal, was uncorroded. Over the plain rectangle of the entrance were the embossed letters in some black substance—Temple of The Principle.

Grimes snorted almost inaudibly.

"What Principle?" he demanded. "There have been so many."

"Perhaps," said Sonya seriously, "the greatest and most mysterious one of all."

"The Golden Way? The greatest, I admit—"

"No. Sally got her paws on such records as still exist—the vaults in the city hall kept their contents quite intact—and found out about a cult that worshiped, or tried to worship, the Uncertainty Principle."

"Could have been quite a suitable religion for this world. Inexplicable forces playing hell with anything and everything—so, if you can't lick 'em, join 'em."

"Or get the hell out."

"Or get the hell out. But—who knows? This freak religion might just have worked. Shall we go inside?"

"Why not?"

The door opened easily, too easily. They might have been expected. But to think so was absurd. The officers from the ship who had found this place must have oiled the hinges. And had they done something about the lighting system, too? The huge, windowless room should have been dark but was not. The gray, subtly shifting twilight was worse than darkness would have been. It accented the wrongness of the angles where wall met wall, ceiling and floor. It seemed to concentrate, in a formless blob of pallid luminescence over the coffin-shaped altar that stood almost in the middle of the oddly lopsided hall. Almost in the middle. Its positioning was in keeping with the rest of the warped geometrics of this place.

"I don't like it," said Grimes. "I don't like it at all."

"Neither do I," whispered Sonya.

Yet neither of them made any

attempt to retreat to the comparative light and warmth and sanity of the alley outside.

"What rites did they practice?" whispered the Commodore. "What prayers did they chant? And to what?"

"I'd rather not find out."

But still they did not withdraw. Still, hand in hand, they advanced slowly towards the black altar, the coffin-shaped—coffin-shaped? No. Its planes and angles shifted.

It was more of a cube.

It was more than a cube.

Grimes knew suddenly what it was. It was a tesseract. And he knew, too, that he should never have come again to this world. Twice he had visited Kinsolving and on the second occasion had become more deeply involved than on the first. Whatever the forces were that ruled this planet, he was becoming more and more attuned to them.

And this was the third time.

"John!" he heard Sonya's distant voice. "John!"

He tightened the grasp of his right hand but the warmth of hers was no longer with it.

"John—"

It was no more than a fading whisper.

•

"John—"

"Grmph—" He didn't want to wake up. Full awareness would mean maximum appreciation of his nagging headache. His eyes were gummed shut and he had the impression that small and noisome animals had fought and done other things inside his mouth.

"John!"

Blast the woman...

"John!"

She was shaking him now.

He flailed out blindly, felt one fist connect with something soft, heard a startled gasp of pain.

"Never touch an officer," he enunciated thickly. "'Gainst Regulations."

"You—you hit me. You brute."

"Own fault."

"Wake up, damn you—"

He forced his eyes open somehow, stared blearily at the plump, faded woman in the shabby robe who was staring down at him with distaste.

Who are you? he demanded silently.

The memory of someone slim, sleek and elegant persisted in his befuddled brain.

Where am I? Who am I?

"You've got a job to do," the woman told him in a voice that was an unpleasant whine. "You'd better get your stinking carcass out of that bed and start doing it. I like to go on eating, even if you don't."

A starvation diet would do you the world of good...

He said out loud, "Coffee?"

"Coffee what? Where's your manners?"

"Coffee, please."

She left him then and he rolled

out of the rumpled bed. He looked down with distaste at his sagging drinker's paunch, then got to his feet and walked unsteadily to the bathroom. He was surprised at the weakness he felt, the near nausea, the protests of a body allowed to degenerate into a state of general unfitness. It all seemed wrong. Surely he had always taken pride in maintaining himself in good condition.

He stood under the shower and gradually the mists cleared from his brain. In a little while, John Grimes, Officer Commanding the Zetland Base, would be ready to begin his dreary day.

Nobody quite knew why the Federation maintained a Base on Zetland. Once, a long time ago, the planet had been strategically important when it seemed possible that the Federation and the expanding Shaara Empire might clash, but the Treaty of Danzenorg, respected by both cultures, had neatly parceled up the entire Galaxy into spheres of influence. True, there were other spacefaring races who belonged neither to the Federation nor to the Empire but their planets were many light years distant from Zetland and their trade routes passed nowhere near this world.

There was a base on Zetland. There always had been one—there always would be one. The taxpayer has bottomless pockets. There were spaceport facilities, of a sort. There were repair facilities, also of a sort. There was a Carlotti Beacon, which was an absolutely inessential part of the navigational network in this sector of space. And there was a relay station. The whole setup, such as it was, could have been run efficiently by a lieutenant, junior grade, with a handful of petty officers and ratings. But a base commander must have scrambled egg on the peak of his cap. The commander of a base like Zetland is almost invariably on the way up or the way down.

John Grimes was not on the way up.

Nonetheless, he did have that scrambled egg on the peak of his cap. There was also a smear of egg yolk at the corner of his mouth and a spatter of it on the lapel of his jacket. His enlisted woman driver, waiting for him in the ground car outside the base commander's bungalow, looked at him with some distaste—apart from anything else, she had been waiting all of twenty minutes—clambered reluctantly out of the vehicle —her legs, noted Grimes, were too thick and more than a little hairy —and threw him a salute that almost, but not quite, qualified as dumb insolence. Grimes returned it contemptuously. She opened the rear door of the car for him. He got in, thanking her as an afterthought, sagged into the seat. She got back behind the controls, clumsily stirred and prodded the

machine into reluctant motion.

The drive to the military spaceport was short. The commander thought, as he had thought many times before, that he should walk to his office rather than ride—the exercise would do him good. But somehow he never felt up to it. He stared unseeingly through the dirty windows. The view was as it always was—flat fields with an occasional low farmhouse, uninteresting machines trudging through the dirt on their caterpillar treads, sowing or reaping or fertilizing the proteinuts which were Zetland's only export, exported to worlds too poverty-stricken to send anything worthwhile in exchange. Ahead was the base—administration buildings, barracks, control tower and the lopsided ellipsoid that was the Carlotti Beacon, slowly rotating.

The car rolled over the concrete apron, jerked to a halt outside the control tower. The girl driver got out clumsily, opened the commander's door.

Grimes got out, muttered, "'K you."

She replied sweetly, "It was a pleasure, sir."

Saucy bitch. . .

He did not take the elevator to his office on the top level of the tower. Thoughts about his lack of physical fitness had been nagging him all morning. He used the stairs, taking them two at a time at first. He soon had to abandon this practice. By the time that he reached his door he was perspiring and out of breath and his heart was hammering uncomfortably.

Ensign Mavis Davis, his secretary, rose from her desk as he entered the office. She was tall, plain and old for her junior rank. She was also highly efficient and was one of the few persons on this world whom Grimes liked.

"Good morning, Commander," she greeted him, a little too brightly.

"What's good about it?" he scaled his cap in the general direction of its peg, missed as usual. "Oh, well, it's the only one we've got."

She said, holding out a message flimsy, "This came in a few minutes ago."

"Have we declared war on somebody?"

She frowned at him. She was too essentially good a person to regard war as a joking matter. "No. It's from *Draconis*. She's making an unscheduled call here."

A Constellation Class cruiser—just what I need. . .

He asked, "When is she due?"

"Eleven hundred hours this morning."

"What?" Grimes managed a grin. "The fleet's in port—or almost in port—and not a whore in the house washed."

"That's not funny, Commander," she said reprovingly.

"Indeed it's not, Mavis," he

agreed. Indeed it wasn't. He thought of the huge cruiser with all her spit and polish and thought of his own, slovenly, planet-based command—with its cracked, peeling paint, dusty surfaces everywhere, equipment working only after a fashion and personnel looking as though they had slept in their uniforms—as many of them all too probably had. He groaned, strode to the robot librarian's console, switched on.

"Fleet List," he said "*Draconis*. Name of commanding officer."

"Yes sir." The mechanical voice was tinny, absolutely unhuman. "Captain Francis Delamere, O.G.C., D.C.O., F.M.H."

Grimes switched off.

Frank Delamere—a lieutenant when I was a two-and-a-half ringer. A real space scout without the brains to come in out of the rain—but a stickler for Regulations. And now he's a four-ring captain. . .

"John."

He detected sympathy in the ensign's voice.

"Yes, Mavis?"

She was abruptly businesslike.

"We haven't much time—but I issued orders in your name to get the place cleaned up a bit. The ground control approach crew has been alerted and the beacons should be in position by now."

Grimes walked to the wide window.

"Yes," he said, looking down at the triangle of intensely bright red lights that had been set out on the gray concrete of the apron, "they are. Thank you."

"Do you wish to monitor G.C.A.?"

"Please."

She touched a switch, and almost immediately there was the sound of a crisply efficient voice.

"*Draconis* to Zetland Base. E.T.A., surface contact, still 1100 hours. Is all ready?"

"All ready, *Draconis*," came the reply in crisp accents.

"Just one small thing, John," said Mavis. She stood very close to him and with a dampened tissue removed the flecks of egg yolk from the corner of his mouth, from his uniform. "Now, let them all come."

"Let them all come," he echoed.

DRACONIS was heard long before she was seen, the irregular throb of her inertial drive beating down from beyond the overcast. And suddenly she was below the cloud ceiling, a great, gleaming spindle, the flaring vanes of her landing gear at her stern. Grimes wondered if Francis Delamere were doing his own pilotage—very often the captains of these big ships let their navigating officers handle the controls during an approach. He thought smugly that this was probably the case now; when Delamere had served under Grimes he had been no great shakes as a ship-handler.

Whoever was bringing the cruiser down was making a good job of it. Just a touch of lateral thrust to compensate for the wind, a steady increase of vertical thrust as altitude diminished, so that what at first had seemed an almost uncontrolled free fall was, at the moment of ground contact, a downward drift as gentle as that of a soap bubble.

She was tall, a shining metallic tower, the control room at her sharp stem well above the level of Grimes' office. Abruptly her Inertial Drive was silent.

"Eleven-oh-oh-oh-seven," announced Mavis Davis.

Grimes grunted.

He retrieved his cap from the floor, let the ensign, who had found a clothes brush somewhere, brush its crown and peak. He put it on.

He said to the girl, "Look after the shop. I have to go visiting."

He left his office, took the elevator down to ground level. He was joined by the base supply officer, the base medical officer and the base engineering officer. All three, he noted, looked reasonably respectable. Grimes in the lead, they marched out to the ramp that was being extended from *Draconis'* after airlock.

It's good to be boarding a ship again—even one commanded by a man who once was my junior and who is now my senior.

As he climbed the ramp he threw back his shoulders and sucked in his belly. He returned the salute of the junior officer at the airlock smartly and then, followed by his own officers, strode into the elevator cage. The woman operator needed no instructions—in a very few seconds the party from the base was being ushered into the captain's day room.

"Ah," said Delamere. "Commander Grimes, isn't it?" He had changed little over the years. His close-cropped hair was touched with gray but he was as boyishly slim and handsome as ever. The four gold rings gleamed bravely on each sleeve and the left breast of his uniform was gaudy with ribbons. "Welcome aboard, Commander."

"Thank you, Captain."

Grimes had no intention of addressing the other as "sir."

"You're putting on weight, John," said the Specialist Commander who was one of the group of officers behind Delamere.

"Maggie!"

"Commander Lazenby," said the captain stiffly, "this touching reunion can be deferred until such time as the base commander and I have discussed business."

"Aye, aye, sir," snapped Margaret Lazenby just a little too crisply.

Delamere glared at her. John Grimes looked at her wistfully. She had not put on weight. She had hardly changed since they had been shipmates in the Census Ship

Seeker. Her red hair gleamed under her cap, her figure was as slim and trim as ever.

But she was not the slender, auburn-haired woman who haunted his dreams.

"Commander Grimes," said Delamere. Then, more loudly: "Commander Grimes."

"Yes, Captain?"

"Perhaps we can get the introductions over with and then you and I can get down to business."

"Certainly, Captain. This is Lieutenant Commander Dufay, the base medical officer. Lieutenant Danby, supplies. Lieutenant Roscoe, engineering."

Delamere introduced his own people and the specialist officers went below, leaving the captain to conduct business with Grimes.

"A drink, Commander?"

"Please, Captain. Gin, if I may."

"You may. Sit down, Grimes." Delamere poured the drinks, took a chair facing the other. "Down the hatch."

"Down the hatch."

The captain grinned.

"Well, Grimes, I don't seem to have caught you with your pants down. Frankly, I was rather hoping I would."

"What do you mean?"

"I haven't forgotten that bad report you put in on me."

"It was truthful," said Grimes. "You were a lousy ship-handler." Then: "By the way, who brought *Draconis* in?"

"None of your business," snapped Delamere, an angry flush on his face. After a moment he continued. "For your information, Grimes, an economy wave is sweeping the Service. There is a cutting out of dead wood in progress. Certain ships, *Draconis* among them, have been selected by our lords and masters to make the rounds of bases such as this one and to report on them. My last call was at Wuggis Three. The base commander who was in charge is now on the retired list. His G.C.A. was in such a state that I was obliged to use the commercial spaceport."

"How nice for you," commented Grimes.

The captain ignored this. "I'm giving you fair warning, Commander. You'd better dedigitate. For the purpose of this exercise a state of war is deemed to exist. *Draconis* has limped into your base with seventy-five per cent casualties, including all technical officers. These same technical officers are, even now, arranging a simulation of extensive damage. The Mannschenn Drive, for example, will require a new governor and will have to have its controls recalibrated. Only one inertial drive unit is functional and that is held together with spit and string. My laser cannon are burned out. My yeast, algae and tissue culture vats contain only slimy, dead messes utterly unfit for human—or even

unhuman — consumption." He laughed. "All the parts that have been removed from machinery and weapons are, of course, securely locked in my storerooms, where your people won't be able to get their greasy paws on them. You, Grimes, starting from scratch, using your people, your workshops, will have to bring *Draconis* back to a state of full fighting efficency, as soon as possible if not before."

"Then I'd better get cracking," said Grimes.

He rose to his feet, glanced briefly and regretfully at his almost untouched glass. It was good liquor, far better than any that could be obtained locally—but even now he was rather fussy about whom he drank with.

"You'd better," agreed Delamere. "Oh, you haven't finished your drink, Commander."

"Your ship's in such a sorry, simulated state," Grimes told him, "that we'll make believe that you need it yourself."

He forgot to salute on his way out.

III

"I KNEW something like this would happen," complained Marian tearfully. "What shall we do, John? What can we do? A commander's pension is not much."

"Too right—it isn't." He looked thoughtfully at the half-inch of oily gin remaining in his glass, brought it to his mouth and swallowed it, gagging slightly. He reached for the bottle, poured himself another generous shot.

"You drink too much," flared his wife.

"I do," he agreed, looking at her. She was almost passable when alcohol had dimmed the sharp edges of his perception.

He murmured: "*Malt does more than Milton can/To justify God's ways to Man. . .*"

"What?"

"Housman," he explained. "A poet. Twentieth Century or thereabouts."

"Poetry." she sneered contemptuously. "But what are you doing about Captain Delamere? He was such a nice young man when he was one of your officers, when we were all happy at Lindisfarne Base."

"Yes, Franky was always good at sucking up to captains' and commodores' and admirals' wives."

"But you must have done something to him, John. Couldn't you apologize?"

"Like hell," growled Grimes. "Like adjectival, qualified hell."

"Don't swear at me."

"I wasn't swearing at you specifically."

"You were thinking it."

"All right, I was thinking it." He finished his drink, stood up, put on his cap. "I'd better get

down to the ship to see what sort of mess my butterfly-brained apes are making of her."

"What difference will your being there make?"

"I'm still commander of this bloody base."

He looked back at her briefly as he reached the door, felt a spasm of pity. She was such a mess. She had let herself go (as he had let himself go). Only faint traces remained of the attractive Ensign Marian Hall, Supply Branch, whom he, on the rebound, had married. Physically she no longer attracted him. Mentally she was—nothing. She read only trash, was incapable of intelligent conversation and could never join Grimes in his favorite pastime of kicking ideas around to see if they yelped. He wondered how things would have worked out if he and Maggie Lazenby had made a go of things. Actually to have Maggie here, on this world, at this juncture was too much.

He walked to the military spaceport. The night was mild, not unpleasant in spite of the wisps of drizzle that drifted over the flat landscape. Now and again Zetland's twin moons appeared briefly in breaks in the clouds but their light was faint and pallid in comparison to the glare of the working floods around *Draconis*.

He tramped slowly up the ramp to the airlock, returned the salute of the O.O.D., one of Delamere's men. The elevator was unmanned —but, after all, the ship had suffered heavy simulated casualties, so ratings could not be spared for nonessential duties. He went first to the "farm." The vats had been cleaned out but the stink still lingered. The cruiser's biochemist had carried out his sabotage-under-orders a little too enthusiastically. Grimes exchanged a few words with Lieutenant Commander Dufay, in charge of operations here, then went down a couple of decks to the Inertial Drive Room. He looked at the confusion without understanding it. Roscoe and his artificers had bits and pieces scattered everywhere. It was like a mechanical jigsaw puzzle.

"She'll be right, Commander," said the engineer lieutenant.

He didn't seem to be convinced by his own words. Grimes certainly was not.

"She'd better be right," he said.

Somebody else was using the elevator, so he decided to take the companionway up to Control—he did know more than a little about navigational equipment—rather than wait. His journey took him through officers' country. He was not altogether surprised when he was accosted by Commander Lazenby.

"Hi, John."

"Hi, Maggie."

"Are you busy?"

He shrugged.

"I should be."

"But we haven't seen each other for years. Come into my dogbox for a drink and a yarn. It's all right—the boy wonder's being wined and dined by the governor in Zeehan City."

"He might have told me."

"Why should he? In any case, he's on the simulated casualty list. He's probably awarded himself a posthumous Grand Galactic Cross."

"With golden comets."

"And a platinum spiral nebula." She laughed. "Come in, John. Take the weight off your feet." The door to her day cabin opened for her. "This is liberty hall. You can spit on the mat and call the cat a bastard."

"You haven't changed, Maggie," he said ruefully, looking at her. "I wish—"

She finished it for him. "You wish that you'd married me instead of that little commissioned grocer's clerk. But you were always rather scared of me, John, weren't you? You were afraid that you, a spacehound pure and simple, wouldn't be able to cope with me, a qualified ethologist. But as an ethologist I could have seen to it that things worked out for us."

She sat down on her settee, crossing her slim, sleek legs. Her thin, intelligent face under the red hair was serious. He looked at her wistfully.

He murmured—and it was as much a question as a statement, "It's too late now."

"Yes. It's too late. You've changed too much. You did the wrong thing, John. You should have resigned after that court martial. You could have gone out to the Rim Worlds to make a fresh start."

"I wanted to, Maggie. But Marian—she's incurably Terran. She made it quite plain that she'd not go out to live among the horrid, rough colonials. As far as she's concerned, everywhere there's a Survey Service base there's a little bit of old Earth, with society neatly stratified. Mrs. Commander is just a cut above Mrs. Lieutenant Commander—and so on down." He fumbled for his pipe, filled and lit it. "She had the idea, too, that My Lords Commissioners would one day forgive me and that she'd finish up as Mrs. Admiral Grimes."

"My heart fair bleeds for you both," she said dryly. "But mix us drinks, John. You'll find the wherewithal in that locker."

"For you?"

"The same as always. BVG, with just a touch of lime."

There was a hologram over the grog locker, a little, brightly glowing window on to another, happier world. It was a beach scene—golden sand, creamy surf, blue sea and sky and the golden-brown bodies of the naked men and women.

Grimes asked, "Do you still spend your leaves on Areadia?"

"I do. It's the only possible planet for an ethologist who takes the back to nature slogan seriously."

"You look happy enough in this hologram." Grimes inspected the three-dimensional picture more closely. "Who is that with you?"

"Peter Cowley. He's a senior biochemist with Trans-Galactic Clippers."

"No. Not him. The woman?"

She got up to come to stand beside him. "Oh, that's Sonya Verrill. Yet another of the commanders with whom the Survey Service is infested. She's Intelligence. Do you know her?"

Grimes stared at the nude woman. She was like Maggie Lazenby in many ways—her figure, her coloring, her facial features, could almost have been those of Maggie's sister. He looked more closely. There should be a mole on her left hip. There was.

"Do you know her?" asked Maggie again.

"Yes—no—"

"Make up your mind."

I don't know her. I have never met her. But I have dreamed about her. I thought it was Maggie in my dreams, a somehow different Maggie—but she hasn't a mole anywhere on her body. . .

He said, "No, I don't know her. But she is like you, isn't she?"

"I can't see any resemblance. You know, she was almost going to call here. She's sculling around this neck of space in one of those little, fully automated armed yachts. Some hush-hush Intelligence deal. But when she heard that this was one of the boy wonder's ports of call she decided to play by herself somewhere."

"Has he met her?" asked Grimes, feeling absurdly jealous.

"Yes. They do not, repeat not, like each other."

"Then there must be some good in her," said Grimes with a quite irrational surge of relief.

"Never mind her. What about me? I'm thirsty."

"All right, all right," said Grimes, mixing the drinks.

WHEN he reached home Marian was waiting up for him.

"You've been drinking," she accused him.

"And so, to coin a phrase, what?"

"I don't mind that so much. But you've been with that—bitch, that Maggie Lazenby."

"I had a couple of drinks with her, that was all."

"Don't lie to me."

"I'm not lying."

No, he wasn't lying. Maggie, in her woman's way, had offered him more than a drink but he had turned it down. Even now he was not sure why he had done so. Or he was sure but would not admit it to himself. His reason was too insane. He had been loyal to a woman whom he had never met, whose

hologram he had seen for the first time in Maggie's day cabin.

"After all I've done for you—and you going sniffing around that carroty alleycat. You're no good, you're just no good. You never were, and you never will be—"

Grimes brushed past her into the living room, the Service severity of which had been marred by his wife's tasteless attempts at interior decoration.

"Say something, damn you. Say something, you waster. Haven't you even the guts to defend yourself?"

The telephone buzzed urgently. Grimes went to it, flipped down the switch. The screen came alive and the plain, almost ugly face of Mavis Davis looked out at him.

"Commander, there's an emergency—"

"Yes?"

"A Mayday."

"Who?" Grimes demanded. "Where?"

"The armed yacht *Grebe*. In solar orbit between Zetland and Freiad." She rattled off coordinates. "Meteor swarm. Extensive hull and machinery damage. Loss of atmosphere. Orbit decaying."

"Mavis, send a car for me. At once."

"Willco, Commander."

"And what can you do?" his wife sneered. "Captain Delamere's got a cruiser and hundreds of really efficient men and women. What have you got?"

"Out of my way," he snarled.

"John, you can't go. I forbid you." She clung to his sleeve but, brutally, he shook her off. She followed him for a little way as he strode out of the house, along the dark road, then gave up. "John!" she called. "John!"

The lights of the car were ahead, approaching rapidly. It passed him, turned, braked. Mavis Davis was driving. He got in beside her.

She said, as she restarted the vehicle, "*Husky*?"

Of course, it had to be the base's space tug *Husky*. Delamere's cruiser was out of commission and the tug at the civilian spaceport was, Grimes knew, undergoing annual survey. *Husky* was the only ship on Zetland capable of getting upstairs in a hurry.

And she was Grimes' toy, his pet. In her he could feel the satisfaction of real command, of symbiosis with his ship. She was the only piece of equipment on the base in absolutely first class condition—Grimes and Mavis, working with their own hands, had kept her so. She was referred to as "the Old Man's private yacht."

"I told Petty Officer Willis to warm her up," said Mavis.

"Good girl."

"Can I come with you?"

"I'd like you to." She was a clerical officer, trained as such, but she should have been an engineer. She possessed the inborn skills, the talents and a keen mathematical

mind. Often she had accompanied Grimes on his short jaunts outside the atmosphere. "You know the little bitch better than anybody else on the base."

"Thank you, John."

The car screamed on to the apron, circled the great, useless, floodlit hulk of *Draconis*. *Husky* was in her own berth, tucked away behind the workshops, a dull metal ovoid standing in her tripedal landing gear like a gray egg in its cup. A circle of yellow light marked her airlock door.

As the car stopped Grimes heard a noise in the sky. A jet was coming in fast. The shriek of its exhaust varied in pitch as its turret drive was used first to brake and then to ease the aircraft to a vertical touchdown. The aircraft slammed to the concrete just a few feet from the car.

A man jumped out of the cabin, confronted Grimes. It was Delamere, still in his mess dress, starched white line, black bow tie, tinkling miniatures and all.

"Is she ready?" he demanded.

"Yes, Captain. I'll have her up and away as soon as the airlock's sealed."

"You aren't taking her up, Grimes. I am." Delamere grinned whitely. "Life's been a little too dull lately."

"Like hell you're taking her up, Delamere. This is my base and my tug."

"And I am your superior officer, Grimes. You'd better not forget it."

"You're not likely to let me, are you? But this is a rescue operation—and I know how to handle a ship."

"Out of my way, you insolent bastard!"

Grimes swung clumsily but with all his weight behind the blow. Delamere wasn't as fit as he looked. Grimes' fist sank deep into his midriff, under the black silk cummerbund. The air was expelled from the captain's lungs. He sat down hard and abruptly. He gasped something about striking a superior officer, about mutiny.

"Willis," Grimes called to the petty officer who had appeared in the airlock. "Drag the captain clear of the blast area. I'm going to use the auxiliary rockets. And keep clear yourself."

"But, sir—"

"You don't want to be up with me on a charge of mutiny. Get out of here and take the captain with you. That goes for you too, Mavis."

"Like hell it does!"

Grimes paused briefly. He could manage the tug singlehanded but with rescue operations involved it would be asking for trouble. He grabbed Mavis by her bony shoulder.

"Scream," he whispered. "I'm dragging you aboard by force."

She screamed, shrieked, "Let go of me—"

From where Delamere sprawled the struggle would look convincing enough. And then they were in the airlock. Grimes hurried up to the little control room while Mavis went to the engines. He plumped down into the pilot's chair and, as he strapped himself in, cast an experienced eye over the telltale lights. Reaction Drive—ready. Inertial Drive—ready. Mannschenn Drive—stand by.

His fingers found the firing studs in the arm of the chair.

He said into the microphone hanging before him, "Secure all. Secure all for blast off."

Mavis' voice came in reply. "All secure, Captain."

"Then—blast."

He pressed the button and *Husky* screamed upstairs like a bat out of hell.

THERE was only one person aboard the crippled *Grebe*, a woman. Her voice was faint, almost incoherent. She was in her suit, she said. She had suffered a broken arm and possibly internal injuries. She thought that she would be able to ship a new air bottle when the one in use was exhausted.

"Can you actuate your Carlotti transceiver?" demanded Grimes urgently.

"I—I think so."

"Try. I'm going to switch to Mannschenn Drive. I'll home on your Carlotti."

"Manschenn Drive?" asked Mavis, who had come up to Control.

"Yes. I want to be there in minutes, not days—and the Mannschenn Drive's the only way. I know it's risky, but--"

It was risky to operate the Drive in a planetary system with its tangle of gravitational and magnetic fields—but it had to be done. Grimes jockeyed the free-falling *Husky* around on her gyroscope, lining her up on the faint signals from the survivor's suit radio. He started the Drive. There was the usual second or so of disorientation in Space and Time—and then, astern of them, Zetland assumed the appearance of a writhing, convoluted ball of luminous gas and ahead and to starboard the sun became an iridescent spiral. Grimes paid no attention. He heard the faint voice from his own Carlotti speaker.

"Carlotti on."

"Can you fix it so that it sends a continuous note? Turn up the gain."

"Willco."

A faint, continuous squeal came from the speaker.

Good. Grimes watched the quivering antenna of his Carlotti Direction Finder and Communicator, the ellipsoid Mobius Strip that was rotating slowly about its long axis. He restarted the Inertial Drive and then, with lateral thrust, using the antenna as a compass needle,

headed the tug directly for the distant wreck. He pushed the Inertial Drive control to full ahead. The irregular throbbing shook the little ship.

"Mavis," he said, "see if you can coax a few more revs out of the bone-shaker."

"I'll try," she told him, and was gone.

A fresh voice came from the speaker. It was Delamere.

"Grimes. Captain Delamere calling ex-Commander Grimes. Do you read me?"

"Loud and clear, Delamere. Get off the air. I'm busy."

"Grimes, I order you to return at once. Ensign Davis, I authorize you to use force if necessary to overcome the mutineer and to assume command of *Husky*."

Grimes watched the antenna. It showed a continual drift of the target in a three o'clock direction. The wreck was in orbit, of course. He would have to allow for that. He did so, applying just the right amount of lateral thrust.

"Grimes. Ensign Davis. Do you hear me?"

Damn the man. So far the antenna was keeping lined up on the signal from the disabled *Grebe*—but with the base transmitting at full power it might topple at any second.

"Grimes here. I can't give any orders but I can appeal to those of you in the Carlotti Room. This is a rescue operation. I'm homing on *Grebe's* Carlotti Beacon. There's a woman out there, in the wreck, and she can't last much longer. Please get off the air and stay off."

He was never to know what happened, but he thought he heard the sound of a scuffle.

He thought he heard a voice—Maggie's voice—whisper, "Pull the fuse—"

He transferred his attention to the spherical tank of the mass proximity indicator. Yes, there it was, a tiny, glowing spark, barely visible. It was drifting fast toward the center of the globe. Too fast? Not really. For a collision to occur, two vessels must occupy the same space at the same time and as long as *Husky's* Mannschenn Drive was operating she was in a Time of her own. But speaking of Time—he didn't want to waste any.

"Mavis, when I put her on full astern I want full astern. No half measures."

"You'll get it," she assured him.

The spark was brighter now, crossing one concentric ring after another. Grimes adjusted the scale of the indicator, pushing the target back to the outermost circle. Still it drove in. Grimes adjusted the scale again and again. Target spark merged with the bead of luminosity that represented *Husky*. For a microsecond there was an uncanny sensation of merging—not of ships, but of two personalities.

"Manschenn Drive—off," snapped Grimes, executing his own order. "Inertial Drive—full astern!"

The ship shuddered, striving to tear herself apart. Colors sagged down the spectrum as the ever-precessing gyroscopes of the Mannschenn Drive were braked to a halt—but outside the viewports the stars, vibrating madly, still looked as they had while the Drive was in operation.

"Stop all," muttered Grimes, jerking the lever to its central position.

And there, scant feet away, rotating slowly about some cockeyed axis, was the torn, buckled hull of the space yacht *Grebe*.

MAVIS DAVIS came up to Control while Grimes was putting on his suit. She was bleeding slightly from an abrasion on her forehead. Like many another plain woman she was beautiful in conditions of emotional and physical stress. Before she lowered the helmet on to his shoulders she kissed him. The contact was brief but surprisingly warm.

Grimes wished that it could have been longer.

She said, "Goodbye. It's been nice knowing you, John."

"What the hell's this, Mavis?"

She grinned lopsidedly. "I have my fey moments—especially when somebody is playing silly buggers with Mannschenn Drive—"

Then she was securing the helmet and further speech was impossible.

Grimes collected what tools he would require on his way down to the airlock. When the outer door opened he found that he could almost step across to *Grebe*. He pushed himself away from his own little ship, made contact with the hull of the other with the magnetic soles of his boots and palms of his gloves. He clambered over her like a clumsy, four-legged spider. He soon discovered that it would be impossible to open *Grebe's* airlock door. But it didn't matter. A few feet away from it was a hole large enough for him to crawl through.

He said into his helmet microphone, "I'm here."

The faint voice that replied at long last held an oddly familiar astringent quality. "And about time."

"Where are you?"

"In the control room."

Grimes made his way forward, using cutting torch and crowbar when he had to. When he found her she was in the pilot's chair, held there by the seat belt. Moving feebly, she contrived to swivel to look at him. *Husky's* floods were on and glaring through the viewports but her face, inside the helmet, was in shadow.

She said, "I hate to have to admit it—but you're right, John."

"What do you mean?"

"What you always say when you deliver yourself of one of your diatribes against automation. 'Never put yourself at the mercy of a single fuse.' My meteor shield might as well have not been there and by the time the alarm sounded it was too late to do anything—"

"Sonya, I've got to get you out of here. Aboard *Husky*."

He fumbled with the strap that held her.

"Too– late." She coughed and the sound of it, telling of fluid-filled lungs, terrified him. "Too—late. I hung on as long–as I could. Start– Mannschenn Drive. Should be some–power–in batteries—"

"Sonya! I'm getting you out of here—"

"No. No—start—Drive–"

But he persisted in trying to unstrap her. Summoning her last reserves of strength she pushed him away. He lost contact with the deck, drifted away from her. He clutched at something–a lever?

It moved in his hand.

He did not hear the Drive starting—there was no air in the ship to carry the sound. But he felt the vibration as rotors stirred into life, was aware that the harsh light of *Husky's* floods had deepened from white to a sullen red. Around him, around Sonya, the Universe lost its substance. But he was solid still, as she was, and her hand was firm in his.

And . . .

SHE was saying, "We found each other again. We found each other again –"

Grimes looked at her, stared at her for a long time, dreadfully afraid that she would vanish. He held her hand tightly. Then, but cautiously, he stared around him at the temple. It seemed to have lost its alien magic. It was just a large, featureless room with the dimensions of a cube. On the floor, annoyingly off center, was a block of black stone in the shape of a coffin.

He said, "That dream . . . If it was a dream . . ."

She said, "There is a fourth-rate Survey Service base on Zetland– "

He said, "The last I heard of Delamere he'd been kicked upstairs to become a deskbound Commodore–"

She said, "Damn your silly dream. Forget about it."

"I'll try," he promised. And then, unbidden, familiar words formed themselves in his mind.

He said them aloud: "To sleep, perchance to dream . . . ay, there's the rub–"

"What's the rub, John?"

He gazed at her.

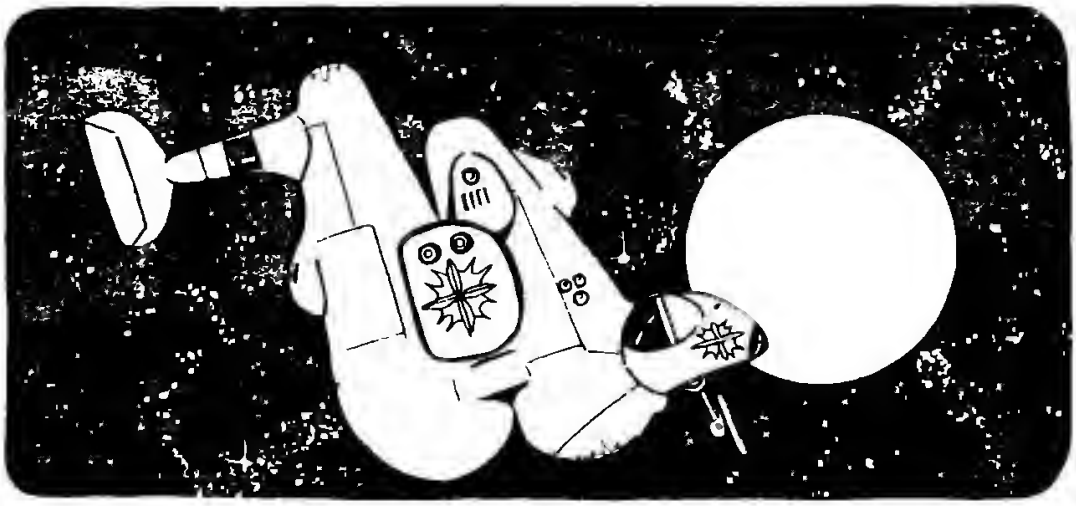
"What is the dream? That or this?"

"What does it matter?" she asked practically. "We just make the best of what we've got." Then, as they walked out of the drab temple, "Damn! My ribs are still hurting!" ★

SUNPOT

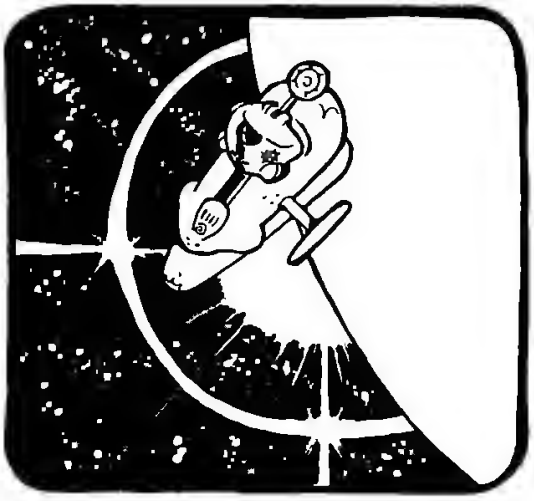
by VAUGHN BODE

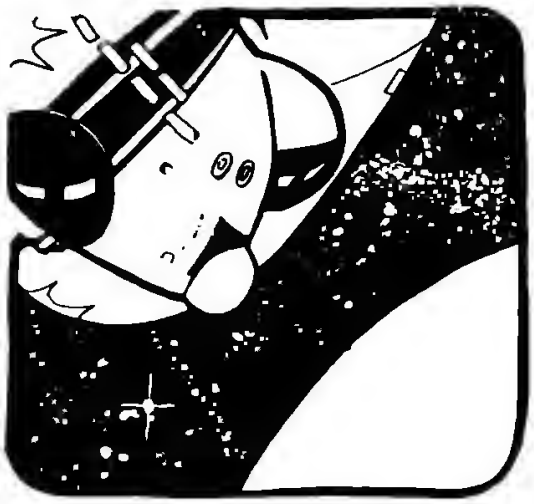
SUNPOT, THE PLANET MOVES ACROSS THE QUIET OPULENCE OF FAT SOLAR SPACE LIKE THE GREAT RED PHALLIC TEMPLE OF BROTHER MERCURY.. WHITE VENUS AWAITS IN THE DISTANCE.



THE SUNPOT VEERS INTO A SLOW TUMBLING VENUSIAN POLAR ORBIT IT ALLOWS ITSELF TO FALL ABOVE VENUS IN THE MATING DANCE OF UNIVERSAL ATTRACTION....

THE HUGE POWER FACTORY IS SHUT DOWN AND THE CREWS OF SCREWS, LIZARDS, FALSIES AND PARAPHERNALIA STAND DOWN FROM SUNPOT'S MAIDEN VOYAGE ACROSS PLANETARY SPACE...

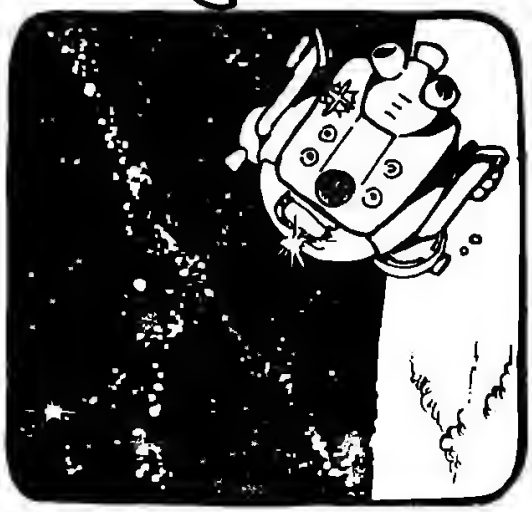


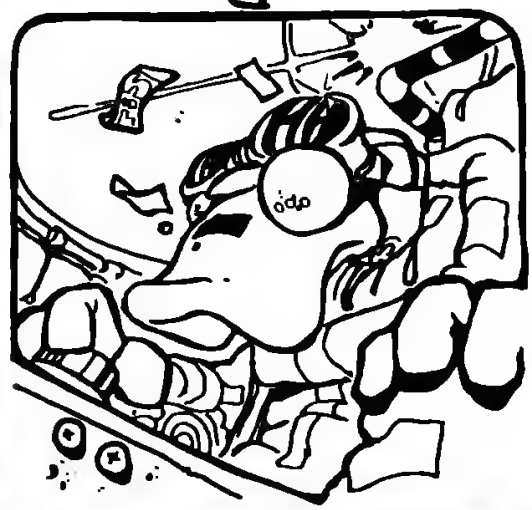



DR. ELECTRIC DISCUSSES STUFF
DR. ELECTRIC? BELINDA BUMP? YOU ASKED TO BE AWAKENED AT VENUS FALL..
WOW! LOOK IT DAT, YOU PINK TIT! VENUS! WE IS IN ORBIT ABOVE VENUS... PUT SUNGLASSES ON-
WOO, THAT'S BRIGHT.. WILL WE SEND A PARTY DOWN INTO THE CLOUDS FOR SURFACE DATA?..
AHH...WE IS HERE TO CHECK OUT OUR PLANET SHIP FOR DEEP SPACE AND 'HIGH C' WORTHINESS, WE GONNA' DO A CURSORY STUDY OF VENUS WIF' INFRARED AN BODY BEAN MAPPERS...
WELL, IT SEEMS A SHAME NOT TO EXPLORE HER.. SHE IS BEAUTIFUL...
SO IS YOU, POWDER PUFF BOOBS.. AN YOU IS A LOT MORE FUN TO EXPLORE..

WOT IS I GONNA DO!! I IS BLIND AN I JUST LOST ALL ENERGY AN COMMUNICATION TRANSMISSION FROM THE SUNPOT PLANET! OH ME!... I IS DIRELY DOOMED FOR SURE! SNIF

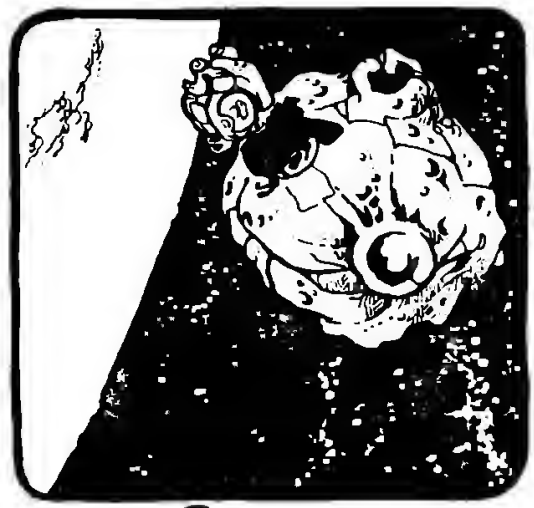
NOW HOLD IT.. I GOT TO REMAIN COOL, DAT'S MY ONLY CHANCE. OLD LT. RUBBER BERRY DON'T GIVE UP ALL DIS EASY.. I HAS ENOUGH FUEL ENERGY LEFT TO DOCK ME WIF THE SUNPOT. I'LL JUST SCAN AN LISTEN FOR A ECHO TRACK..





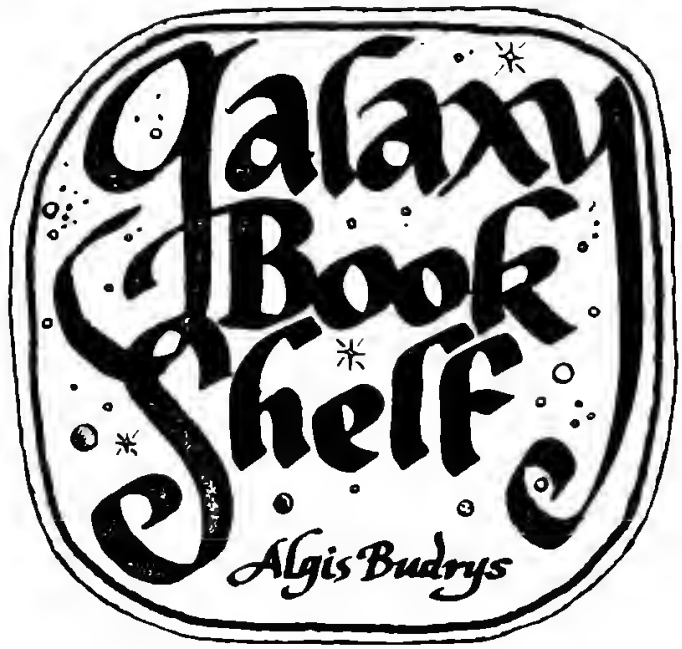
BEEP-BABEEP BEEP BEEP BEEP.

HURRAH, I GOTS A BOUNCING RADIO ECHO! IT A STRONG ONE.. STRONG ENOUGH DAT I'LL BE DOCKED WIF SUNPOT IN A HALF HOUR.



HELLO, SUNPOT.. DIS IS BEAN 26. HELLO'.. HUM... I HAS BEEN DOCKED FOR TWO HOURS NOW AN NOBODY HAS COME OUT TO GET ME... CLICK, CLICK.. MAYBE MY RADIO ON DA' BLINK.


THE MOONS OF VENUS
BOOY BEAN NO.26, PLEASE CEASE YER MAP SCANNING AND RETURN TO SUNPOT. ALL OTHER BEANS ARE IN..
26
NO STEP
MAN, VENUS! BRIGHT AS A GLARING WINTER SNOWFIELD IN DA AFTERNOON..
NO.26, WE ARE LOSING TRANSMISSION LOCK ON YOU! YOU IS WAY DA HELL BELOW OUR HORIZON...
OKAY, SUNPOT, I IS COMING. I JUS' WANT TO TAKE ONE LAST LOOK SEE. I'LL LIFT UP ME SUNGLASSES..
BEAN 26.. DON'T LOOK AT VENUS WIT-OUT YOUR DARK GOGGLES, YOUSE CAN GET SNOW BLIND.
YARGH! I CAN'T SEE. I IS SNOW BLIND!
TO BE CONTINUED



The Universal Baseball Association, Inc.-J. Henry Waugh, Prop. Robert Coover

"*The name of the game is life—death, God, sex and vengeance!*" This quote from *Book Week* appears on the Signet edition of a marvelously wrought book called *The Universal Baseball Association, Inc.-J. Henry Waugh, Prop.* by Robert Coover. It's Signet book T3890, 75c. (By the time you read this, you may have to order it by mail from New American Library, the publishers. Information on how to do this is available in every Signet, Mentor, and NAL book; the price is cover price plus 10c plus applicable sales taxes. In rare cases it's worth the trouble, and this is one of those cases).

Anyway. The name of the game is life and all those other things. Under a blurb like that, you'd expect no less a title than *Lincoln's Doctor's Dog*. But the title Coover gives you is entirely accurate. The book is about J. Henry Waugh's relationship to the full-scale major baseball league he operates in his mind, aided by chance. (Chance as modified by whimsy and by an inability to let chance operate with complete freedom when the big chips are down). Thus, very quickly you do get the idea that it's a book about God. There's also death and sex. And the overt central problem gets to be whether it is or isn't about vengeance.

But let's look at it through our eyes, which are not always overt. Is it about a science-fiction theme? Yes, it is. It does not bear the standard trappings of science fiction—whereas, for instance, Ted Sturgeon's "Microcosmic God" does—but it answers excellently to the needs of the sf mind-bent. In fact, this book—which baffled a succession of book reviewers in its original edition, and apparently didn't do too well in the market—may find its natural and most appreciative audience among us.

You don't have to be a baseball fan. J. Henry Waugh, for instance, is not a baseball fan. He is a middle-aged bachelor bookkeeper who is a games fan. Like so many others before him, he is attracted not to the action on the diamond but to the statistics of accomplishment. Like a youngster relentlessly banging a tennis ball against a wall, playing pitcher against himself, counting a one-bounce catch as a single or a complete miss as a home run, Henry sits in his kitchen, rolling dice and consulting the complex of charts he he has evolved over the years.

He's a grown man with appropriate training, so his rules are more elaborate than one-bounce-is-a-single. Henry throws three dice whose various possible falls not only ordain an event in his mind but predetermine the general nature of the next fall, and sometimes the exact nature of the past. For example, a third successive roll of three ones, read out on the supplementary Extraordinary Occurrences chart, means: *Batter fatally struck by bean ball.* When it happens when Damon Rutherford, phenomenal young pitcher, radiating class in every lineament and motion, dies in the dust on Damon Rutherford Day before a stricken throng including his father, Former Ace Brock Rutherford—it is an event no different in essence from those created by Sturgeon's protagonist when he sent the sky crushing down on his Neoterics. But it happens not to a few impersonal creatures scuttling about anonymously under an impermeable dome but to the finest, most gallant, most accomplished, most sexually potent figure in the U.B.A. and in Henry's mind.

Henry's mind is a disquietingly familiar place—an alien landscape whose every feature is drawn from recognizable dreams. On the surface, Henry is a bathetic figure—the isolated craftsman-bachelor driven by time's passage into the blind alley of the only creativity available to him. Instead of sawing out a thousand birdhouses in a basement workshop, or creating the most elaborate miniature train layout in his neighborhood . . . or building up a complete mint collection of *Weird Tales* . . . Henry not only creates his baseball game, with its elaborate but rational rules that anyone with the pa-

tience might follow, he also creates the supportive paraphernalia.

He spends "winters" between seasons in writing up the individual histories of the clubs in his league, and in evolving background events, such as the time Long Lew Lydell raped old Fennimore McCaffree's spinster daughter in the Knickerbocker dugout in front of five thousand wide-eyed spectators. (It worked out all right —Lew made an honest woman of Fanny, being forced to marry her because McCaffree's Legalist Party couldn't have stood the scandal otherwise).

As you can see, almost from the beginning the U.B.A.'s now extensive history has been playing itself out in a universe not quite like this one. Such features of the landscape as an unhindered public rape, and a baseball league whose official actions are affected by several political parties contending within it, are not overtly identical with the real world. But any objective view of this situation is constantly being obscured by Coover's skill at forcing the reader to suspend his judgment and see Henry deal with the real world in terms of the imaginary one.

For Henry is not going the trite route. For a very long while he is able to go out socializing with bartenders and B-girls while firmly encased in the matrix of the U.B.A.'s history rather than his own. The isolation that might make him a schizoid recluse is the very same freedom from contradictory stimuli that might enable him to go on to the end of his days with his private creation, harming no one grievously, and helping himself to survive beyond mere mortality. In his apartment full of U.B.A. statistics, chronicles, and memories, he is building up a coherent body of work with its own total validity. It's all there.

"Into the Book went the whole U.B.A., everything from statistics to journalistic dispatches, from seasonal analyses to general baseball theory. Style varied from the extreme economy of factual data to the overblown idiom of the sportswriter, from the scientific objectivity of the theoreticians to the literary speculations of essayists and anecdotalists. There were tape-recorded dialogues, player contributions, election coverage, obituaries, satires, prophecies, scandals."

In other words, it was Henry's creativity that gave Damon Rutherford a name, a parentage and a manifest destiny. But it was the dice, and Henry's game rules, that made him a prominent figure in the U.B.A. So prominent, in fact, that he deserved a Damon Rutherford Day. It was the dice that killed him as he came to bat in Henry's mind. But it was Henry's creativity, endowing him with his peculiar grace and poise, his overt

(Please turn to page 154)

NO PLANET LIKE HOME

He was a hideous mutation
and needed someone to love!

ROBERT CONQUEST

REALLY, in spite of the circumstances, the creature was too funny, thought Damals. It was almost impossible not to laugh. And at that moment one of the four watchers sniggered audibly. Another pressed a button on the arm of his chair.

The gesture extinguished the film and at the same time swept back the covers from the hyperbola of transparent material forming two thirds of the wall. Outside it was evening and a grove of trees similar to those in the film filtered a patchwork of starlight onto the sleek richness of the estate.

The one who had cut off the film turned round with some asperity.

"Really Ziel! There isn't room for humor in the situation—even, I should have thought, for one not so closely affected as myself."

Damals, the psychologist, found himself apologizing for Ziel, the biologist—more or less automatically as befitted a fellow scientist but rather reluctantly. During dinner Ziel had shown himself a brash clumsy career-maker.

Damals found himself saying, "I think you can see, Senator, that the results are clownishly funny, if one can distinguish the humor from the tragedy and feel both at the same time—as I suppose most scientists can."

Senator Enedee, nearly two feet taller than Damals, looked down at him mildly and said, "Of course, I am too strained. We all rely on your skill and patience. Your patience—"

"—is, if anything, excessive," said the fourth person, a smile on his dark grizzled face. He was the smallest of the four and seemed the most restive.

"Don't say that, Rampo." Damals turned to him with something of the awkwardness they had just seen on the screen, "Patience is a quality our civilization lacks. There is no help for that, I suppose, in general. But in some specialized fields—how much we need it."

Ziel, who had not yet spoken, said, "I have sufficient impatience to want to get down to business. We have not yet been told officially why we are here. But it is obvious enough. Senator Enedee has collected the Principal of the Institute of Mutational Psychiatry, the Colonial Ministry's senior anthropological adviser and a biologist who, though not up to the same standard, at least has the advantage of being available in this planetary system. You show us a film of a being whom I take to be your nephew Tontor, a barely viable mutation."

"An unviable mutation" said the senator gloomily.

"The main point, Ziel," the Damals put in, seeing that it was about to be made anyway, "is that you have just seen Tontor as he is after two years of educational therapy at my Institution."

"Ah—"

Ziel's heavy modesty had made little impression on the other two scientists. His professional status was, if anything, higher than theirs and not only because of the enormous importance of biology in their culture. His positive and rather overbearing manner was probably a reflection of the pushfulness that had carried him to one of the key power posts not subject to election. Damals could see by various slight signs that Rampo did not like Ziel any more than he did. What the senator's feelings were was not so apparent—either he was better at concealing his sentiments or the fact that he was not a scientist made him less jealous.

"It can be stated definitely," continued Damals, who knew the value of a positive statement, "that no further significant improvement is possible."

The senator poured out four drinks, giving the last to Ziel as he said, "I imagine, knowing your efficiency, that you checked on Tontor's record before you arrived here this evening. Is there anything for me in it?"

"No. You must realize that at birth he really was quite unviable. Emergency biological and surgical work was carried out at once, as usual. I have checked the reports and they are unexceptionable. Further tests were taken and adjustments made at various suitable ages in infancy and adolescence—one of them by Zoroz, who, as you know, is now senior biological adviser in the Arb galaxy. There were all perfectly done. Tontor is now as good as biology—and apparently as psychology—can make him."

"I didn't really expect anything more," said the senator. "Indeed, I took the opportunity of your visit to the system to get you to do me the favor of dining with me for more general reasons."

"For a galactic senator to be honored by the visit of a simple biologist—that's the wrong way around, your excellency."

"Everyone knows that a biologist ranks most highly these days."

This time Damals could interpret quite easily the look that went with the senator's remark—presumably he had realized that subtlety was lost on Ziel.

Ziel went on: "The more general reasons, no doubt, are to obtain my opinion on a possible revision of the Biological Laws. But surely you are not going to tell me that the unfortunate case of your nephew has changed your attitude to the public good?"

This question had been in the minds of both Damals and Rampo, but they had scarcely expected to hear it stated so bluntly. Damals, who had formed a good opinion of the senator, awaited his answer.

SHOWING no signs of annoyance, the politician said slowly,

"Well, I suppose my sister's feelings—as she has finally realized that nothing more can probably be done—have made the question more vivid to me. But the question is by no means only a matter of my personal interests. You must know that tragedies such as Tontor have become increasingly common in the last generation. And you may also know that a group of reasonably responsible politicians is considering making an issue of the public discontent. The advantages cannot outweigh the misery caused by the present laws—or such is their idea. Unless some way of modifying the effects of the laws can be found the laws themselves will have to be altered. What is your view?"

For the first time Ziel showed an emotion other than self-satisfaction but, he succeeded in controlling himself.

He finished his drink and said in a rather formal voice, "The government's policy in this matter, at any rate, is quite unpolitical. It takes the advice of its biological advisers, which may be said to be unanimous on the point."

"May be said to be?"

"No—for practical purposes we are unanimous. We have considered a few alternatives on minor points only. But perhaps it would be best if I gave you a brief analysis of the whole position. Then we can decide."

Ziel, now back at his most self-satisfied, waited while the senator poured out another round of drinks.

"As you know," Ziel said, "we are the only race in the universe, as far as is known, whose blood contains—and whose metabolism needs—radioactive salts on a large scale. This peculiarity has always resulted in a mass of mutations. At some point in the recent past a dominant mutation arose whose characteristic was a large increase in the use and conservation of these salts. This development in turn has led to such an increase in mutation that absolutely pure breeding may now be said to have vanished. Of every thousand mutations about one is favorable, four more combine favorable and unfavorable characteristics and one is about even. A further forty are unfavorable, though not impossibly so. Another hundred are naturally lethal but reclaimable by modern techniques—the rest are absolutely lethal. Even with the assistance of the most advanced methods we cannot produce more than a few normal fertile sperms from any one male. The same sort of limitation applies to our females. Without allowing for accidents this means that the continuity—and in particular the progress—of the race, depend on salvaging every possible viable case in the hope that perhaps a mental—or nervous—advantage has accompanied the physical disadvantage.

If this had not been done we should probably have regressed considerably even in the last hundred years."

"That is quite correct," said Damals.

Ziel, who clearly did not require such confirmation, finished his speech more abruptly than he had perhaps intended: "Tontor is a biological triumph. I have just seen photographs of him at birth. His present physique must represent weeks of successful work by several specialists. The psychologists have not been so successful?"

"No", said Damals. "Of course, the slowness of his nervous reactions is one obstacle. Unfortunately the surgeons couldn't speed that up."

Rampo, no expert, had said nothing. But the quick movement of his eyes from speaker to speaker gave some indication of his real talkativeness. He now started to open his mouth but at that moment the biologist took a brisk, efficient look at his timepiece and got up.

"Well, Senator, I must be off. I'll go over and have a check of Tontor myself, though I can hold out little hope that I'll find anything. His condition is pretty final. And I'll have a report sent you—it should clear up any ideas you may have about revising the laws. Goodbye."

IN THE balcony, as the three men watched the glow of Ziel's jet fade into the cloudy south, the tall politician asked slowly, "How right is he?"

Damals looked sideways at him. It was difficult to tell how badly the senator really took all this. For a moment Damals was tempted to take some of the edge off the crude positiveness of Ziel's case. But he would really be raising false hopes, he supposed.

So he said, "If anything, he understated the case. The biologists are struggling along with such a bare margin that mutational progress is infinitesimal. Every mutation that can be made to live must be."

The senator took the pronouncement with the easy strength that had made him a famous figure in a dozen galaxies.

"Well, anyhow, I'm glad in a way Ziel isn't as successful at solving problems as he is at everything else. And now I'll get out a bottle I keep for guests who are guests and not bio-politicians."

A little machine slid silently across the balcony. Its taps poured into three great tankards.

"It's curious to think that physicists, if it weren't for our special problems, might have been our important scientists. They're much more successful in their way," said Rampo. "Look at that wine-robot—far more efficient than lots of mutations."

"Well, that was another possibility that had occured to me,"

said the senator. "Could robots be built—with a protoplasmic outer cover—at Tontor's level to be companions to him, as you might say. I seem to have read something about such developments."

"The technique has been quite well worked out," said Damals, "but it's not really practicable. I say nothing of the cost, which is considerable. There is another problem. Look at your wine robot. It has at most some twenty actions to perform. And even so it is fairly bulky. A humanoid robot cannot carry its reflex interpreters. They fill a fair-sized room. What happens in the ones they build is that the robot is beamed to a hidden reflex interpreter, usually under the floor. It needs about a million beams—so their range cannot be allowed to be more than about fifteen yards. If you could buy a spare planet and a staff of forty or fifty first-class physicists and psychologists you might do it—but even then results would be far from satisfactory. The robots can be made quick and efficient, which Tontor is not—but I doubt they could be given even a tenth of Tontor's actual I.Q., which is not really lower than ours by a factor of more than ten or twenty."

"Well, everything seems to be against us, doesn't it?" said Enedee.

He was now drinking his sixth glass. The scientists were on their second, but there was no noticeable difference in the behavior of the three.

"I hope Rampo won't mind my asking if you expected a contribution from him. Or is he here, as he well deserves to be, only for his good company?"

"As a wine-taster, probably," Rampo said, "I'm chairman of the Zovol wine society, as you probably didn't know—I'll be able to report back favorably, especially on the second bottle. Kon Eighty-six, I think?"

"Yes—well, that's the sort of reason you were asked for. That society. You have fingers in all sorts of pies—you've been around some odd galaxies. You might have some notions we hadn't heard of on the Tontor problem—though of course it isn't only a Tontor problem. It must affect millions of parents."

"Well, Senator, I've no real ideas as you've noticed—but I think it's just possible I might get some if I did a spot of research in various libraries. If you could get me and Damals—I'd like his aid—a week or so's leave and find us a good craft, I'll do my best."

"Your abrupt production of full marching orders reminds me of Ziel," said Damals. "But I know it's due to the opposite reason—laziness, not ambitious efficiency. Still, as long as you don't promise anything I agree to associate myself with this somewhat doubtful venture."

RAMPO sat at the control board as the little ship lifted in an unwinding spiral from Zom's surface, past its satellite and that curious little body—the satellite's satellite. Picking up speed, the craft edged out vertically away from the direction of the galactic center.

"Look at all those stinking stars," said Damals, who was beginning to feel agreeably irresponsible at this unaccompanied and probably pointless trip. His and Rampo's friendship dated from student years.

"Yes, but think of all the stinking galaxies" said Rampo, "and how few of us there are to run them really—and little squirts like Ziel near the top."

"If you ask me," Damals said feelingly as his stomach took the uncomfortable lurch into the second transfinite, "the physicists are to blame. If we were all in a few galaxies—or better still, systems—we'd be quite enough. It was this sickening nondimensional drive that did it. No time at all."

"Allowing for acceleration and this and that," qualified Rampo.

"Yes—and allowing for power, which means allowing for money, which means that an impatient professor can hardly go more than a dozen or so galaxies away in his mangy little runabout. Not but what this—" he looked at the nameplate —"*Polambi*, isn't good. Where are we going?"

Rampo paused to focus the pseudovision screen. On it a couple of white whirls zipped past.

"Paran."

Damals was so surprised that he dropped the breakfast capsule he was opening.

"What sort of ship is this, anyhow?"

"The senator's own Administration Emergency Z-two. It would get clear to Roudabon itself in half a day. How do we rate it? He wrote out a chit of political emergency and it released itself. I imagine there's more in the political crisis about mutational viability than meets the eye—we're a very paternal race. Do you know that I've been on dozens of planets where they'd think nothing of killing off Tontor?"

Damals was shocked out of his preoccupation with their destination.

"No!"

"Yes."

"I seem to remember reading something of the kind, now I come to think of it, in protopsychology, when I was a student."

"Yes—and your unscientific memory was naturally pulled out from under it."

"Only the most insensitive students were chosen for anthropology, I remember."

"It's due to field anthropology that I can pilot this crate—and we're going to Paran and not some hick library like Sof. There are

parks of the old Z-ones for field anthropologists in every big sector, though how they manage it on the schockingly mean little budget I don't know," said Rampo, watching the light patches which were now flicking past the screen almost as fast as his amazingly quick nervous system could follow them —about six hundred a second.

"Now in the galaxy which has just edged off the screen—eight-nine-nine Lambadan—I had an experience with which I will now pass away a weary watch in relating, among the natives of Gam, a planet in Gambonnen."

Damals reached for the nearest bottle and, placing it to his mouth, closed his eyes demonstratively.

He said, "I will think of Paran, meanwhile—where we spent the happiest days of our youth. I begin to doubt that this trip is going to be as pointless as I suspected."

PARAN, in Galaxy 84 Purince, like most really habitable planets, circles a sun of a dazzling blue. The weather at the city of Paran has been described ad nauseum as perpetual spring but in reality the true spring is the best season. Young folk from all over the universe who can blackmail, dupe or persuade anyone to finance their fares, come there to the ancient university or, without the formality of enrolling themselves, for something more vaguely defined as "study." Rampo and Damals had been on Paran many years before for two short semesters, for it is mainly as a center of the less rigorous sciences that the ancient city has its renown.

The library is one of the few score entitled to an electronic copy of every publication in the universe. Its underground files stretch under more than half the land surface of the globe to a depth of several miles.

Rampo settled the *Polambi* at a little port away from the great river island where bookships were pulling in every few hours. He switched on the parking field, tuned it to a permit-tester, signed and thumbed it, opened the hatch and rolled out the ladder.

The air of Paran poured in at a very slightly higher pressure and mixed its superior oxygen and radon content with the ship's air.

"It's really too young for us."

"Nonsense. You'll adjust only too quickly to a second childhood," said Damals, going down the steps.

It was late afternoon.

"I thought we'd go to the library, book a couple of rooms and place a few orders," said Rampo. "It's too late to do any serious work today. Besides—"

Besides, there are a lot of things to do in Paran in the evening, particularly for academic people like Damals and Rampo, even though the latter was still able to revert occasionally to the more wander-

ing and exciting life of his subordinates, the field anthropologists. Each other's company and the ambience of Paran made the two friends feel considerably younger and more active and neither required professional advice on the anthropology or psychology of Paran night-life. After the sun set in a blue-purple splendor to the east they abandoned the riverfront cafés and took to a cellar dive of the student quarter called the Crazy Galaxy, whose sign showed a number of stars in various undignified postures. As Damals and Rampo descended the narrow stone stairs into a surprisingly well decorated cylindrical room with alcoves, the manager stepped up, bowing.

"An alcove, excellencies—"

They sat down in the alcove. Its one-way vision opened to the floor where some sort of entertainment was now going on.

Damals said, "That's what comes of being dressed too well. One forgets how one looked a hundred years ago. The trouble is that we haven't the scrip to pay for much of that 'excellency' stuff."

Rampo produced from his pocket a roll of notes larger than any Damals had seen before in his life —except on one occasion on Volomba when he had suddenly been called upon to attend a brilliant but unbalanced credit director whose room was actually knee deep in currency.

"What's that from?"

Rampo said airily, "An advance on the expense account. I have signaled for two bottles of Zomonon goldwater to start off."

"I suppose those two so-called dancers are in the fashion from some god-knows-where galaxy that has come in since our times", said Damals. "They remind me of an emergency case I once dealt with in frec fall on an intrasystem liner in—"

Rampo interrupted with: "This will make you less clinical, for God's sake." Two cups of glittering liquid slid onto the table. "Soon you'll be more like a case than a psychologist, I hope."

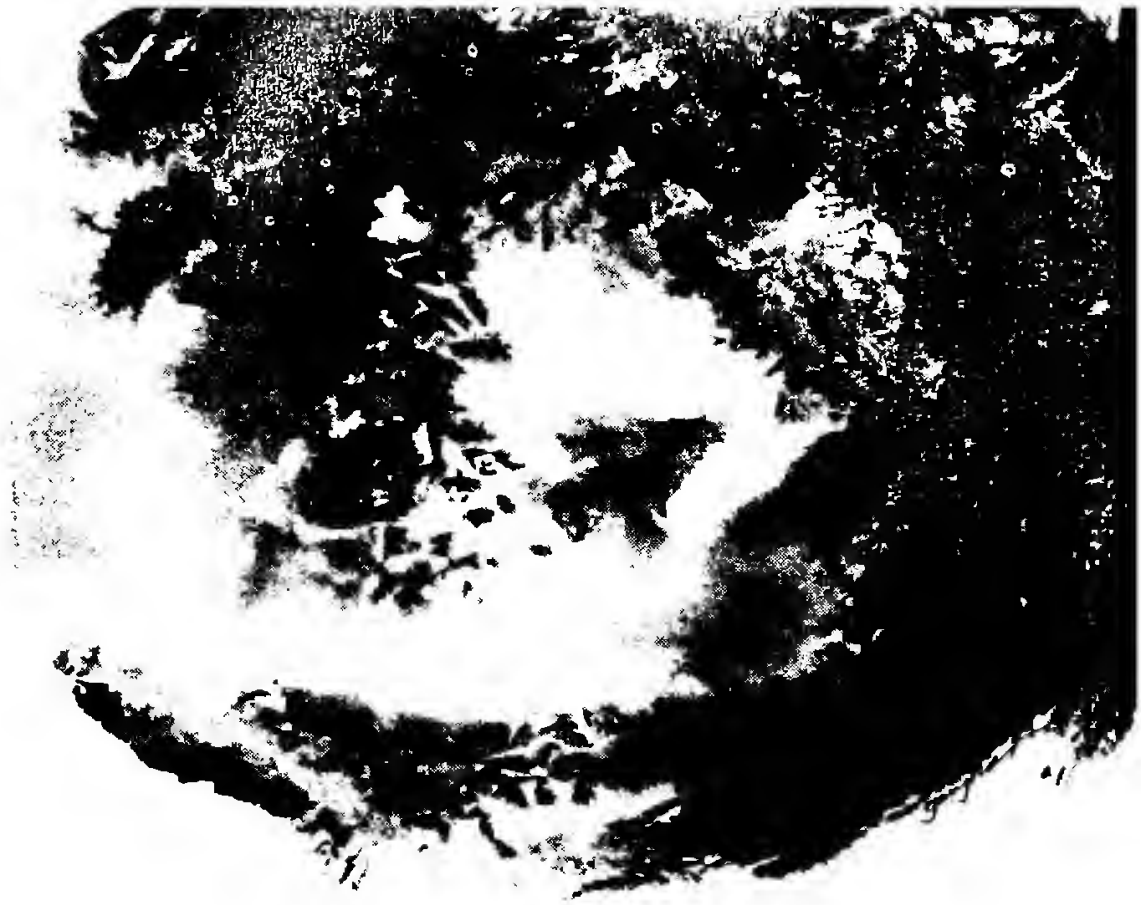
"I've never had this before. It's wonderful."

After an hour they left and went to the Swan Room, thence to the Blue Nova, the Obolologo, the Zipetizap and the Thrust Field. Only the Obolologo was as it had been in their time. The rest struck them as tourist-ridden, though probably most of the tourists were ex-students like themselves.

In the streets the air was soft and warm and the sky as calm as it had been a hundred years before.

Later they went back to the Crazy Galaxy. Downstairs everything had changed. The narrow dark cylinder had opened up into a flickering sphere and all the alcoves had disappeared, leaving their tables in the middle of the en-

(Please turn to page 155)



KINDERGARTEN

JAMES E. GUNN

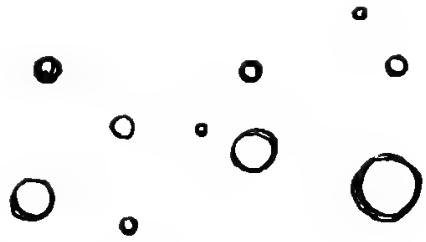
. . . asks a simple question. Have you done your homework today?

First day—

Teacher told my parent that I am the slowest youngster in my class, but today I made a star in the third quadrant of kindergarten.

Teacher was surprised. Teacher tried to hide it and said the solar phoenix reaction is artistic, but is it practical?

I don't care. I think it's pretty.



Second day—

Today I made planets: four big ones, two middle-sized ones, and three little ones. Teacher laughed and said why did I make so many when all but three were too hot or too cold to support life and the big ones were too massive and poisonous for any use at all.

Teacher doesn't understand. There is more to creation than mere usefulness.

The rings around the sixth planet are beautiful.

Third day—

Today I created life. I begin to understand why my people place creation above all else.

I have heard the philosophers discussing the purpose of existence, but I thought it was merely age. Before today joy was enough: to have fun with the other kids, to speed through endless space, to explode some unstable star into a nova, to flee before the outrage of some adult—this would fill eternity.

Now I know better. Life must have a function.

Teacher was right: only two of the middle-sized planets and one of the little ones were suitable for life. I made life for all three, but only on the third planet from the sun was it really successful.

I have given it only one function: survive!

Fourth day—

The third planet has absorbed all my interest. The soupy seas are churning with life.

Today I introduced a second function: multiply!

The forms developing in the seas are increasingly complex.

The kids are calling me to come and play, but I'm not going.

This is more fun.

Fifth day—

Time after time I stranded sea-creatures on the land and kept them alive long past the time when they should have died. At last I succeeded. Some of them have adapted.

I was right. The sea is definitely an inhibiting factor.

The success of the land-creatures is pleasing.

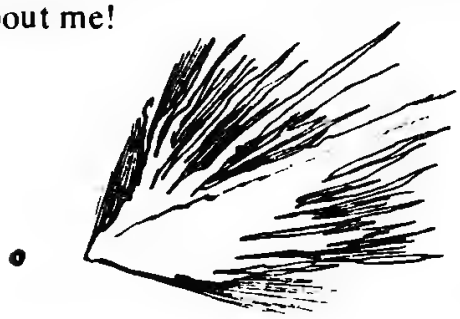
Sixth day—

Everything I did before today was nothing. Today I created intelligence.

I added a third function: know!

Out of a minor primate has developed a fabulous creature. It has two legs and walks upright and looks around it with curious eyes. It has weak hands and an insignificant brain, but it is conquering all things. Most of all, it is conquering its environment.

It has even begun speculating about me!



Seventh day—

Today there is no school.

After the pangs and labors of creation, it is fun to play again. It is like escaping the gravitational field of a white dwarf and regaining the dissipated coma.

Teacher talked to my parent again today. Teacher said I had developed remarkably in the last few days but my creation was hopelessly warped and inconsistent. Moreover, it was potentially dangerous.

Teacher said it would have to be destroyed.

My parent objected, saying that the solar phoenix reaction in the sun would lead the dangerous life form on the third planet to develop a thermonuclear reaction of its own. With the functions I had given that life form, the problem would take care of itself.

It wasn't my parent's responsibility Teacher said, and Teacher couldn't take the chance.

I didn't hear who won the argument. I drifted away, feeling funny.

I don't care, really. I'm tired of the old thing anyway. I'll make a better one.

But it was the first thing I ever made, and you can't help feeling a kind of sentimental attachment.

If anyone sees a great comet plunging toward the sun, it isn't me.

Eighth day—

(Continued from page 67)

gent, we are human beings, we wish no longer to be alone in the cosmos.

—In what language will you tell them this?

In the language of random numbers. And then, in not-so-random numbers. Hello, hello, 3.14159, did you hear that, 3.14159, the ratio of diameter to circumference?

—And how will you say this to them? Lasers? Radio waves?

Too slow, too slow. I cannot wait for electromagnetic radiations to go forth and come back. We will talk to the stars with tachyon-beams and I will tell the starfolk about Simeon Krug.

KRUG trembled on the table. The android masseuses clawed his flesh, pounded him, drove knuckles into his massive muscles. Were they trying to tap the mystic numbers into his bones? 2-4-1, 2-5-1, 3-1? Where was the missing 2? Even if it had been sent, what would the sequence mean, 2-4-1, 2-5-1, 2-3-1? Nothing significant. Random. Random. Meaningless clusters of raw information. Nothing more than numbers arrayed in an abstract pattern and yet they carried the most important message the universe ever had seen:

We are here.

We are here.

We call out to you.

And Krug would answer. He shivered with pleasure at the thought of his tower completed and the tachyon-beams pouring out into the galaxy. Krug would reply, Krug the rapacious, Krug the insensitive moneyman, Krug the dollar-hungry boor, Krug the mere industrialist, Krug the fat peasant, Krug the ignorant, Krug the coarse. I! Me! I! Krug! Krug!

"Out," he snapped to the andriods. "Finished!"

The girls scurried away, rushing for the door in a tangle of lithe naked bodies. Krug rose, slowly resumed his garments, walked across the room to run his hands over the pattern of yellow lights.

"Messages?" he asked. "Visitors?"

The head and shoulders of Leon Spaulding appeared in midair, glistening against the invisible webwork backdrop of a sodium-vapor projector.

"Dr. Vargas is here," the ectogene said. "He's waiting in the planetarium. Will you see him?"

"Natuarally. I'll go up. And Quenelle?"

"She went to the lake house in Uganda. She'll wait for you there."

"And my son?"

"Paying his inspection call on the Duluth plant. Do you have instructions for him?"

"No," Krug said. "He knows what he's doing. I'll go to Vargas now."

The image of Spaulding winked

out. Krug entered his liftshaft and rose swiftly to the domed planetarium on the highest level of the building. Under its coppered roof the slight figure of Niccolo Vargas paced intently. To his left was a display case holding eight kilograms of proteoids from Alpha Centauri V; to his right, a squat cryostat in the frosty depths of which could dimly be seen twenty liters of fluid drawn from Pluto's methane sea.

Vargas was an intense, fair-skinned little man for whom Krug entertained a respect bordering on awe: a man who had spent every day of his adult life searching for civilizations in the stars and who had mastered all aspects of the problems of interstellar communications. Vargas' specialty had left its imprint on his features. Fifteen years earlier, incautiously exposing himself to the beam of a neutron telescope in a moment of intolerable excitement, Vargas had baked the left side of his face beyond hope of tectogenetic repair. They had regrown his ruined eye but they had not been able to do much about the decalcification of the underlying bony structure except to shore it up with beryllium-fiber matting, and so part of Vargas' skull and cheek now had a slumped, shriveled look. Deformities such as that were unusual in an era of easy cosmetic surgery—Vargas, however, had no apparent interest in undergoing further facial reconstruction—however easy.

Vargas smiled his lopsided smile as Krug entered.

"The tower is magnificent," he said.

"Will be," Krug corrected.

"No. No. Already magnificent. A wondrous torso. The sleekness of it, Krug, the bulk, the upward thrust! Do you know what you are building there, my friend? The first cathedral of the galactic age. In thousands of years to come, long after your tower has ceased to function as a communications center, men will go to it and kneel, kiss its smooth skin and bless you for having built it. And not only men."

"I like that enough," said Krug. "A cathedral. I hadn't seen it that way." Krug caught sight of the data cube in Vargas' right palm. "What do you have there?"

"A gift for you."

"A gift?"

"We have tracked the signals to their source," Vargas said. "I thought you would like to see their home star."

Krug lurched forward.

"Why did you wait so long to tell me? Why didn't you say something while we were at the tower?"

"The tower was your show. This is mine. Shall I turn on the cube?"

Krug gestured impatiently toward the receptor slot. Vargas deftly inserted the cube and activated the scanner. Bluish beams of

interrogatory light lanced into the small crystal lattice, mining for the stored bits of information.

The stars blossomed on the planetarium's ceiling.

Krug was at home in the galaxy. His eyes picked out familiar landmarks: Sirius, Canopus, Vega, Capella, Arcturus, Betelgeuse, Altair, Fomalhaut, Deneb, the brightest beacons of the heavens, strewn spectacularly across the dome above him. He sought the near stars, those within the dozen-light-year radius that man's stellar probes had reached in his own lifetime: Epsilon Indi, Ross 154, Lalande 21185, Barnard's Star, Wolf 359, Procyon, 61 Cygni. He looked toward Taurus and found red Aldebaran glowing in the face of the Bull, the Hyades clustered far behind and the Pleiades burning in their brilliant shroud. Again and again the pattern on the dome shifted as focuses narrowed, as distances grew. Krug felt thunder in his breast. Vargas had said nothing since the planetarium had come to life.

"Well?" Krug demanded at last. "What am I supposed to see?"

"Look toward Aquarius," said Vargas.

Krug scanned the northern sky. He followed the familiar track across: Perseus, Cassiopeia, Andromeda, Pegasus, Aquarius. Yes, there was the old Water-Carrier, between the Fishes and the Goat. Krug struggled to recall the name of some major star in Aquarius but came up with nothing.

"So?" he asked.

"Watch. We sharpen the image now."

KRUG braced himself as the heavens rushed toward him. He could no longer make out the patterns of the constellations—the sky was tumbling and all order was lost. When the motion ceased he found himself confronted by a single segment of the galactic sphere, blown up to occupy the whole of the dome. Directly above him was the image of a fiery ring, dark at the core, rimmed by an irregular halo of luminous gas. A point of light glimmered at the nucleus of the ring.

Vargas said, "This is the planetary nebula NGC Seven-two-nine-three in Aquarius."

"And?"

"It is the source of our signals."

"How certain is this?"

"Absolutely," the astronomer said. "We have parallax observations, a whole series of optical and spectral triangulations, several confirming occultations and much more. We suspected NGC Seven-two-nine-three as the source from the beginning but the final data was processed only this morning. Now we are sure."

Dry-throated, Krug asked, "How distant?"

"About three hundred light-years."

"Not bad. Not bad. Beyond the reach of our probes, beyond the reach of efficient radio contact. But no problem for the tachyon-beam. My tower is justified."

"And there still is hope of communicating with the senders of the signals," Vargas said. "What we all feared—that the signals came from some place like Andromeda, that the messages had begun their journey toward us a million years ago or more—"

"No chance of that now."

"No. No chance."

"Tell me about this place," Krug said. "A planetary nebula—what kind of thing is that? How can a nebula be a planet?"

"Neither a planet nor a nebula," said Vargas, beginning to pace again. "An unusual body. An extraordinary body." He tapped the case of Centaurine proteoids. The quasi-living creatures, irritated, began to flow and twine. Vargas said, "This ring that you see is a shell, a bubble of gas, surrounding an O-type star. The stars of this spectral class are blue giants, hot, unstable, remaining on the main sequence only a few million years. Late in their life-cycle some of them undergo a catastrophic upheaval comparable to a nova—they hurl forth the outer layers of their structure, forming a gaseous shell of great size. The diameter of the planetary nebula you see is about one-point-three light-years and it is growing at a rate of perhaps fifteen kilometers a second—and that the central sun is tossing out so much hard radiation that the shell is fluorescing?"

"Yes."

"And you also want me to believe that there's an intelligent race inside that furnace sending us messages?"

Vargas said, "There can be no doubt about where the signals are coming from."

"IMPOSSIBLE!" Krug roared. "Impossible!" He hammered his fists against his hips. "A blue giant—only a couple of million years old to begin with. How do you evolve life at all, let alone an intelligent race? Then some kind of solar blowup—how does anything survive that? And the hard radiation? Tell me. Tell me. You want me to design a system that's a good bet not to have life, I give you this goddamned planetary nebula! But how signals? From what?"

"We have considered these factors," Vargas said softly.

Quivering, Krug asked, "Then the signals are natural phenomena after all? Impulses radiated by the atoms of your filthy nebula itself?"

"We still believe the signals have an intelligent origin."

The paradox baffled Krug. He retreated, sweating, confused. He was only an amateur astronomer —he had read plenty, had stuffed

himself with technical tapes and knowledge-enhancing drugs; he knew red giants from white dwarfs; he could draw the Hertzsprung-Russell diagram; he could look at the sky and point out Alpha Crucis and Spica but all of it was data of an external kind, decorating the outer walls of his soul. He was not at home in it as Vargas was. He lacked a sense of the inwardness of the facts. He could not easily move beyond the bounds of the given data. Thus his awe of Vargas. Thus his discomfort now.

"Go on," Krug muttered. "Tell me what. Tell me how."

Vargas said, "There are several possibilities. All speculative, all guesses, you understand? The first and most obvious is that the signal-senders of NGC Seven-two-nine-three arrived there after the blowup, when things were quiet again. Say, within the last ten thousand years. Colonists from a deeper part of the galaxy—explorers—refugees—exiles—whatever, recent exiles."

"And the hard radiation," Krug said. "Even after things were quiet again, there'd still be radiation from that murderous blue sun."

"Obviously they would thrive on it. We need sunlight for our life-processes—why not imagine a race that drinks its energy a little higher up the spectrum?"

Krug shook his head. "Okay, you make up races, I play *advocatus diaboli*. They eat hard radiation, you say. What about the genetic effects? What kind of stable civilization can they build with a mutation rate that high?"

"A race adapted to high radiation levels would probably have a genetic structure that isn't as vulnerable to bombardment as ours. It would absorb all kinds of hard particles without mutating."

"Maybe. Maybe not." After a moment Krug said, "Okay, so they came from someplace else and settled your planetary nebula when it was safe. Why don't we have signals from the someplace else, too? Where's the home system? Exiles, colonists—from where?"

"Maybe the home system is so far away that the signals won't reach us for thousands of years," Vargas suggested. "Or perhaps the home system doesn't send out signals. Or—"

"You have too many answers," Krug muttered. "I don't like the idea."

"That brings us to the other possibility," said Vargas. "That the signal-sending species is native to NGC Seven-two-nine-three."

"How? The blowup—"

"Maybe the blowup didn't bother them. This race might thrive on hard radiation. Mutation may be a way of life for them. We're talking about aliens, my friend. If they're truly alien we can't comprehend any of the parameters. So look—speculate along with me. We have a planet of a blue star, a planet that's

far away from its sun but nevertheless is roasted by fantastically strong radiation. The sea is a broth of chemicals constantly boiling. A broth of mutations. Life is spawned a million years after the cooling of the surface. Things happen fast on such a world. Another million years and there's complex multi-celled life. A million more to mammal-equivalents. A million more to a galactic-level civilization. Change, fierce, unending change."

"I WANT to believe you," Krug said darkly. "I want to. But I can't."

"Radiation-eaters," Vargus went on. "Clever, adaptable, accepting the necessity, even the desirability, of constant violent genetic change. Their star expands —very well, they adapt to the increase in radiation. They find a way to protect themselves. Now they live inside a planetary nebula with a fluorescent sky around them. Somehow they detect the existence of the rest of the galaxy. They send messages to us. Yes? Yes?"

Krug clutched Vargas, pulled him close, shook him. "I want to believe!"

"Then believe. I believe."

"It's only a theory. A wild theory."

"It accounts for the data we have," said Vargas. "Do you know the Italian proverb: *Se non è vero, è ben trovato*? 'Even if it isn't true, it's well invented.' The hypothesis will do until we have a better one. It answers the facts better than the theory of a natural cause for a complex repetitive signal coming to us in several media."

Turning away, releasing the little man, Krug stabbed at the activator as though he no longer could bear the image on the dome, as though he felt the furious radiation of that alien sun raising deadly blisters on his own skin. In his long dreams he had seen something entirely different. He had imagined a planet of a yellow sun, somewhere, eighty, ninety light-years away, a gentle sun much like the one under which he had been born. He had dreamed of a world of lakes and rivers and grassy fields, of sweet air tinged perhaps with ozone, of purple-leaved trees and glossy green insects, of elegant slender beings with sloping shoulders and many-fingered hands, quietly talking as they moved through the groves and vales of their paradise, probing the mysteries of the cosmos, speculating on the existence of other civilizations, at last sending their message to the universe. He had seen them opening their arms to the first visitors from Earth, saying, *Welcome, brothers, welcome—we knew you had to be there.* All of that was destroyed now. In the eye of his mind Krug saw a hellish blue sun spitting demonic fires into the void, saw a blackened and sizzling

planet on which scaly armored monstrosities slithered in pools of quicksilver under a sullen sky of white flame, saw a band of horrors gathering around a nightmarish machine to send an incomprehensible message across the gulf of space.

And these are our brothers? It is all spoiled, Krug thought bitterly.

"How can we go to them?" he asked. "How can we embrace them? Vargas, I have a ship almost ready, a ship for the stars, a ship to carry a sleeping man for centuries. How can I send it to such a place?"

"Your reaction surprises me. Such distress I did not expect."

"Such a star I did not expect."

"Would you have been happier if I told you that the signals were after all mere natural pulses?"

"No. No."

"Then rejoice in these strange brothers and forget the strangeness. Think only of the brotherhood."

Vargas' words sank in. Krug found strength. His innate optimism carried him surging out of bleakness. The astronomer was right. However strange those beings might be, however bizarre their world—always assuming the truth of Vargas' hypothesis—they were civilized, scientific, outward-looking. Our brothers. If space folded upon itself tomorrow and Earth and its sun and all its neighbor worlds were engulfed and thrust into oblivion, intelligence would not perish from the universe, for they were there.

"Yes," Krug said. "I rejoice in them. When my tower is done I send them my hellos."

Two and a half centuries had passed since man first had broken free of his native planet. In one great dynamic sweep the spaceward drive had carried human explorers from Luna to Pluto, to the edge of the solar system and beyond and nowhere had they found trace of intelligent life. Lichens, bacteria, primitive low-phylum crawlers, yes, but nothing more. Disappointment was the fate of those archeologists who had hatched fantasies of reconstructing the cultural sequences of Mars from artifacts found in the desert. There were no artifacts. And when the star probes had begun to go forth, making their decades-long reconnaissances of the nearest solar systems, they had returned with—nothing. Within a sphere a dozen light-years in diameter, there evidently had never existed any life form more complex than the Centaurine proteoids, to which only an amoeba need feel inferior.

Krug had been a young man when the first star probes returned. It had displeased him to see his fellow Earthmen constructing philosophies around the failures to find intelligent life in the nearby solar systems. What were they saying, these apostles of the New Geo-

centricism? Krug smiled grimly.

We are the chosen ones!

We are the only children of God!

On this world and no other did the Lord fashion His people!

To us falls the universe as our divine heritage!

Krug saw the seeds of paranoia in that kind of thinking.

HE HAD never thought much about God. But it seemed to him that men were asking too much of the universe when they insisted that on and only on this small planet of one small sun had the miracle of intelligence been permitted to emerge. Billions upon billions of suns existed, worlds without end. How could intelligence not have evolved again and again and again across the infinite sea of galaxies?

And it struck him as megalomania to elevate the tentative findings of a sketchy search through a dozen light-years into an absolute statement of dogma. Was man really alone? How could you know? Krug was basically a rational man. He maintained perspective on all things. He felt that mankind's continued sanity depended on an awakening from this dream of uniqueness, for the dream was sure to end. And if the awakening came later rather than sooner the impact might be shattering.

"When will the tower be ready?" Vargas asked.

"Year after next. Next year, if we have luck, maybe. You saw this morning—unlimited budget." Krug frowned. He felt suddenly uneasy. "Give me the truth. Even you, you spend all your life listening to the stars, you think Krug's a little crazy?"

"Absolutely not."

"Sure you do. They all do. My boy Manuel, he thinks I ought to be locked up but he's afraid to say it. Spaulding out there—him, too. Everybody, maybe even Thor Watchman—and he's building the damned thing. They want to know what's in it for me. Why do I throw billions of dollars into a tower of glass. You, too, Vargas!"

The twisted face grew even more taut. "I have nothing but sympathy for this project. You injure me with these suspicions. Don't you think making contact with an extrasolar civilization is as important to me as it is to you?"

"Ought to be important to you. Your field—your study. Me? Businessman. Maker of androids. Owner of land. Capitalist, exploiter, maybe a little bit of a chemist, know something about genetics, yes, but no astronomer, no scientist. It's a little crazy, eh, Vargas, for me to care about a thing like this? Squandering of assets. Nonproductive investment. What kind of dividends do I get from NGC Seven-two-nine-three, huh? You tell me. You tell me."

Nervously Vargas said, "Per-

haps we ought to go downstairs. The excitement—"

Krug slapped his chest. "I've just turned sixty. I got a hundred years to live—more, maybe. Maybe two hundred, who knows? Don't worry about me. But you can admit it. You know it's crazy for an ignoramus like me to get so interested in something like this." Krug shook his head vehemently. "I myself know it's crazy. I have to explain me to me all the time. I just tell you, this is something has to be done and I do it—this tower. This hello to the stars. I was growing up, they kept telling us, We're all alone, We're all alone, We're all alone. I didn't believe it. Couldn't. Made the billions—now I'll spend the billions, get everybody straight in the head about the universe. You found the signals. I'll answer them. Numbers back for numbers. And then pictures. I know how to do it. One and zero, one and zero, one and zero, black and white, black and white, keep the bits going and they make a picture. You just fill in the boxes on your chart. This is what we look like. This is water molecule. This is our solar system. This is—" Krug halted, panting, hoarse, taking note for the first time of the shock and fear on the astronomer's face. In a more peaceful tone he said to Vargas, "I'm sorry. I shouldn't shout. Sometimes I run off at the mouth."

"It's all right. You have the fire of enthusiasm. Better to get carried away sometimes than never to come alive at all."

Krug said, "You know what started it? This planetary nebula you threw at me. Upset me, I tell you why. I had a dream I'd go to the place the signals were coming from. Me, Krug, in my slup, under deepsleep, sailing a hundred, even two hundred light-years, ambassador from Earth, a trip nobody ever took before. Now you tell me what a hell world the signals come from. Fluorescent sky. O-type sun. A blue-light furnace. My trip's off, eh? Got me worked up, the surprise of it—but don't worry. I adapt. I absorb good stiff jolts. Knocks me to a higher energy state, is all." Impulsively he gathered Vargas to him in a fierce bear-hug. "Thank you for your signals. Thank you for your planetary nebula. Thank you a million, you hear, Vargas?" Krug stepped back. "Now we go downstairs. You need money for the laboratory? Talk to Spaulding. He knows it's carte blanche for you any time any size money."

Vargas left, talking to Spaulding. Alone in his office, Krug found himself ablaze with surplus vitality, his mind flooded with a vision of NGC 7293. Indeed he resonated at a higher energy state—his skin itself was a fiery jacket for him.

"Going out," he grunted.

He set the transmat coordinates for his Uganda retreat and stepped through. A moment later he was seven thousand miles to the east, standing on his onyx veranda, looking down at the reedy lake beside his lodge. To the left, a few hundred meters out, a quartet of hippos floated, nothing showing but pink nostrils and huge gray backs. To the right he saw his mistress Quenelle, lolling bare in the shallows. Krug stripped. Rhino-heavy, impala-eager, he pounded down the sloping shore to join her in the water.

III

IT TOOK Watchman only a couple of minutes to run to the accident site but by then the lift beetles had moved the fallen block and the bodies of the victims were exposed. A crowd had gathered, all betas. The gammas lacked authority and motivation for interrupting their work programs even for something like this. Seeing an alpha approach, the betas faded back, hovering on the edge of the scene in uneasy conflict. They did not know whether to return to work or to remain and offer assistance to the alpha and, thus caught unprogramed, they stood by, wearing the dismal expressions of android bewilderment.

Watchman quickly surveyed the situation. Three androids—two betas and a gamma—had been crushed by the glass block. The betas were beyond easy recognition. It was going to be a chore just to peel their bodies out of the permafrost. The gamma beside them had almost avoided being killed but his luck had not quite been good enough. He was intact only below the waist. His had been the legs Watchman had seen sticking out from under the block. Two other androids had been struck by the falling scooprod. One of them, a gamma, had taken a fatal blow on the skull and was lying in a sprawl a dozen meters away. The other, a beta, had apparently received a glancing but devastating swipe in the back from a corner of the rod's grip tread—he was alive but seriously injured and plainly in great agony.

Watchman selected four of the beta onlookers and ordered them to transport the dead ones to the control center for identification and disposal. He sent two other betas off to get a stretcher for the injured one. While they were gone he walked over to the surviving android and looked down, peering into gray eyes yellow-rimmed with pain.

"Can you talk?" Watchman asked.

"Yes." A foggy whisper. "I can't move anything below my middle. I'm turning cold. I'm starting to freeze from the middle down. Am I going to die?"

"Probably," Watchman said. He

He ran his hand along the beta's back until he found the lumbar neural center. With a quick jab he shorted it. A sigh of relief came from the twisted figure on the ground.

"Better?" the alpha said.

"Much better, Alpha Watchman."

"Give me your name, beta."

"Caliban Driller."

"What were you doing when the block fell, Caliban?"

"Getting ready to go off shift. I'm a maintenance foreman. I walked past here. They all started to shout. I felt the air hot as the block came down. I jumped. And then I was on the ground with my back split open. How soon will I die?"

"Within an hour or less. The coldness will rise until it gets to your brain and that will be the end. But take comfort: Krug saw you as you fell. Krug will guard you. You will rest in the bosom of Krug."

"Krug be praised," Caliban-Driller murmured.

The stretcher-bearers were approaching. When they were still fifty meters away a gong sounded, marking the end of the shift. Instantly every android who was not actually hoisting a block rushed toward the transmat banks. Three lines of workers began to vanish into the transmats, heading for their homes in the android compounds of five continents. In the same moment the next shift began to emerge from the inbound transmats, coming out of leisure periods spent in the recreation zones of South America and India. At the sound of the gong Watchman's two stretcher-bearers made as if to drop the stretcher and rush for the transmats. He barked at them and, sheepishly, they hustled toward him.

"Pick up Caliban Driller," he commanded, "and carry him carefully to the chapel. When you're done with that you can go off shift and claim credit for the time."

Amid the confusion of the changing shift the two betas loaded the injured android on the stretcher and made their way with him to one of the dozens of extrusion domes on the northern perimeter of the construction site. The domes served many uses—some were storage depots for material, several were kitchens or washrooms, three housed the power cores that fed the transmat banks and the refrigeration tapes. One was a first-aid station for androids injured on the job and one, in the heart of the irregular clutter of gray plastic mounds, was the chapel.

At all times two or three off-duty androids lounged in front of that dome, seemingly idle, actually functioning as casual sentries who would prevent any womb-born one from entering. Sometimes journalists or guests of Krug came wandering this way. The sentries had

various deft techniques for leading them away from the chapel without actually provoking the forbidden clash of wills between android and human. The chapel was not open to anyone born of men and woman. Its very existence was unknown to any but androids.

THOR WATCHMAN reached it just as the stretcher-bearers were setting Caliban Driller down before the altar. Going in, he made the proper genuflection, dropping quickly to one knee and extending his arms, palms upward. The altar, resting in a purple bath of nutrient fluids, was a pink rectangular block of flesh that had been synthesized precisely as androids themselves were synthesized. Though alive, it was scarcely sentient, nor was it capable of sustaining its life unaided. It was fed from beneath by constant injections of metabolase that permitted it to survive. To the rear of the altar was a full-sized hologram of Simeon Krug, facing forward. The walls of the chapel were decorated with the triplets of the RNA genetic code, inscribed in infinite reduplication from floor to summit:

AAA AAG AAC AAU
AGA AGG AGC AGU
ACA ACG ACC ACU
AUA AUG AUC AUU
GAA GAG GAC GAU
GGA GGG GGC GGU
GCA GCG GCC GCU
GUA GUG GUC GUU


AUC
ACC
AUC
CAC

CAA CAG CAC CAU
CGA CGG CGC CGU
CCA CCG CCC CCU
CUA CUG CUC CUU
UAA UAG UAC UAU
UGA UGG UGC UGU
UCA UCG UCC UCU
UUA UUG UUC UUU

"Put him on the altar," Watchman said. "Then go out."

The stretcher-bearers obeyed.

When he was alone with the dying beta Watchman said, "I am a Preserver and I am qualified to be your guide on your journey to Krug. Repeat after me as clearly as you can: *Krug brings us into the world and to Krug we return.*"

"*Krug brings us into the world and to Krug we return.*"

"*Krug is our creator and our protector and our deliverer.*"

"*Krug is our creator and our protector and our deliverer.*"

"*Krug, we beseech Thee to lead us toward the light.*"

"*Krug, we beseech Thee to lead us toward the light.*"

"*And to lift the Children of the Vat to the level of the Children of the Womb.*"

"*And to lift the Children of the Vat to the level of the Children of the Womb.*"

"*And to lead us to our rightful place—*"

"*And to lead us to our rightful place—*"

"*—beside our brothers and sisters of the flesh.*"

"*—beside our brothers and sisters of the flesh.*"

"*Krug our maker, Krug our preserver, Krug our master, receive me back into the Vat.*"

"*Krug our maker, Krug our preserver, Krug our master, receive me back into the Vat.*"

"*And grant redemption to those who come after me—*"

"*And grant redemption to those who come after me—*"

"*In that day when Womb and Vat and Vat and Womb are one.*"

"*In that day when Womb and Vat and Vat and Womb are one.*"

"*Praise be to Krug.*"

"*Praise be to Krug.*"

"*Glory be to Krug.*"

"*Glory be to Krug.*"

"*AAA AAG AAC AAU be to Krug.*"

"*AAA AAG AAC AAU be to Krug.*"

"*AGA AGG AGC AGU be to Krug.*"

"*AGA AGG AGC—*" Caliban Driller faltered. "The chill is in my breast," he murmured. "I can't—I can't—"

"Finish the sequence. Krug awaits you."

"*—AGU be to Krug.*"

"*ACA ACG ACC ACU be to Krug.*"

The beta's fingertips dug into the yielding flesh of the altar. The tone of his skin had deepened in the past few minutes from crimson to something close to violet. His eyeballs rolled. His lips curled

back. His breath came noisily.

"Krug awaits you," Watchman said fiercely. "Do the sequence!"

"Can't—speak—can't—breathe—"

"Listen to me, then. Just listen. Make the codons in your mind as I say them. *AUA AUG AUC AUU be to Krug. GAA GAG GAC GAU be to Krug. GGA GGG—*"

Desperately Watchman went down the rows of the genetic ritual as he kneeled next to the altar. With each group of codons he rotated his body in the prescribed double helix, the proper motion for the last rites. Caliban Driller's life ebbed swiftly. Toward the end, Watchman pulled a tie-line from his tunic, jacked one end into the input in his forearm and the other into Driller's. He pumped energy into the shattered beta to keep him going until all the RNA triplets had been named. Then, only then, when he was certain that he had sent Caliban Driller's soul to Krug, did Watchman unjack, arise, murmur a brief prayer on his own behalf. He summoned a team of gammas to haul the body away for disposal.

TENSE, drained, yet jubilant over the redemption of Caliban Driller, he left the chapel and headed back toward the control center. Halfway there his way was blocked by a figure of his own height—another alpha. That seemed strange. Watchman's shift would not be over for some hours yet—when it was, the alpha Euclid Planner was scheduled to arrive and relieve him. But this alpha was not Planner. He was altogether unfamiliar to Watchman.

The stranger said, "Watchman, may I have some time? I am Siegfried Fileclerk of the Android Equality Party. Of course you know of the constitutional amendment that we propose to have our friends introduce in the next Congress. It has been suggested that in view of your close association with Simeon Krug you might be helpful to us in our desire to gain access to Krug for the purpose of obtaining his endorsement for—"

Watchman cut in, "Surely you must be familiar with my position concerning involvements in political matters."

"Yes, but at this time the cause of android equality—"

"Can be served in many ways. I have no wish to exploit my connection with Krug for political purposes."

"The constitutional amendment—"

"Pointless. Pointless. Friend Fileclerk, do you see that building yonder? It is our chapel. I recommend you visit it and cleanse your soul of false values."

"I am not in communion with your church," said Siegfried Fileclerk.

"And I am not a member of your political party," Thor Watchman said. "Excuse me. I have responsibilities in the control center."

"Perhaps I could speak with you when your shift has ended."

"You would then be intruding upon my time of resting," Watchman said.

He walked briskly away. It was necessary for him to employ one of the neural rituals of tranquility to ease the anger and irritation surging within him.

Android Equality Party, he thought disdainfully. Fools! Bunglers! Idiots!

IV

MANUEL KRUG had had a busy day.

0800, California. Awakening, at his home on the Mendocino coast. The turbulent Pacific almost at his front door; a thousand-hectare redwood forest as his garden; Clissa beside him in bed, cat-soft, catshy. His mind fogged from last night's Spectrum Group party in Taiwan, where he had let himself drink too much of Nick Ssu-ma's millet-and-ginger liqueur. His beta houseman's image on the floating screen, urgently whispering, "Sir, sir, please get up. Your father expects you at the tower." Clissa cuddling closer against him. Manuel blinking, struggling to cut through the web of fleece swaddling his brain. "Sir? Pardon, but you left irrevocable instructions that you were to be awakened!" A forty-cycle note rumbling out of the floor; a fifteen-megacycle cone of sound slicing down out of the ceiling; himself impaled between the two, unable to escape back into sleep. Crescendo. Wakefulness, reluctant, grudging. Then a surprise: Clissa stirring, trembling, taking his hand, putting it over one of her little cool breasts. His fingertips converging on the nipple and finding it still soft. As expected. A bold overture from the child-woman—but flesh weak if spirit willing. They had been married two years and despite all his earnest and skillful efforts he had not succeeded yet in fully arousing her senses.

"Manuel—" she whispered. "Manuel—touch me all over—"

He felt cruel, turning her off.

"Later," he said, as the terrible spikes of sound met in his brain. "We have to get up now. The patriarch is waiting for us. We're going to the tower today."

Clissa pouted. They tumbled from bed. Instantly the damnable sonics ceased. They showered, breakfasted, dressed.

"Are you sure you really want me to come?" she asked.

He said, "My father made a point of inviting you. He thinks it's high time you saw the tower. Don't you want to go?"

"I'm afraid I'll do something foolish, say something naive. I feel

so awfully young when I'm around him."

"You are awfully young. Anyway, he's fond of you. Just pretend you're terribly terribly fascinated by his tower and he'll forgive you for anything silly you might say."

"And the other people—Senator Fearon, the scientist and whoever else—Manuel, I feel embarrassed already."

"Clissa—"

"All right. All right."

"And remember—the tower is going to strike you as the most marvelous enterprise of humanity since the Taj Mahal. Tell him that after you've seen it. Not in so many words. Get the idea across your own way."

"He's really serious about the tower, isn't he?" she asked. "He actually expects to talk to people in the stars."

"He does."

"How much will it cost?"

"Billions," Manuel said.

"He's draining our heritage to build that thing. He's spending everything."

"Not quite everything. We'll never hurt for cash. Anyway, he made the money—let him spend it."

"But on an obsession—a fantasy—"

"Stop it, Clissa. It isn't our business."

"Tell me this at least. Suppose your father died tomorrow and you took charge of everything. What would happen to the tower?"

Manuel set up the coordinates for their transmat jump to New York.

"I'd halt work on it the day after tomorrow," he said. "But I'll gut you if you ever let him know that. Get in, now. Let's go."

1140, New York. Midmorning already and he had been awake only forty hurried minutes after arising at eight. That was one of the little troubles of the transmat society—you kept dropping whole segments of time into hidden pockets if you jumped from west to east.

Naturally there were compensating benefits when you went the other way. In the summer of '16, on the day before his wedding, Manuel and some of his friends of the Spectrum Group had raced the dawn westward around the world. They began at 0600 on a Saturday in the Amboseli Game Preserve, with the sun coming up back of Kilimanjaro, and off they went to Kinshasa, Accra, Rio, Caracas, Veracruz, Albuquerque, Los Angeles, Honolulu, Auckland, Brisbane, Singapore, Pnompenh, Calcutta, Mecca. No visas were needed in the transmat world, no passports; such things were too obviously absurd with instantaneous travel available. The sun plodded along, as always, at a feeble thousand miles an hour – the leaping travelers had no such

handicap. Although they paused fifteen minutes here, twenty minutes there, enjoying a cocktail or nipping a floater, buying small souvenirs, touring famous monuments of antiquity, yet they constantly gained time, pressing farther and farther backward into the previous night, outstripping the sun as they sped about the globe, striding into Friday evening. Of course, they lost all they had gained when they crossed the dateline and were dumped into Saturday afternoon. But they nibbled away the loss by continuing westward. And when they came around to Kilimanjaro again it was not yet eleven on the same Saturday morning from which they had departed, but they had circled the world and had lived a Friday and a half.

You could do such things with a transmat. You could also, by timing your jumps with care, see two dozen sunsets in a single day, or spend all your life under the blaze of eternal noon. Nevertheless, arriving in New York at 1140 from California, Manuel resented having had to surrender this segment of morning to the transmat.

HIS father greeted him formally in his office with a pressure of palms and hugged Clissa with somewhat more warmth. Leon Spaulding hovered uneasily to one side. Quenelle stood by the window, back to everyone, studying the city. Manuel did not get along with her. He generally disliked his father's mistresses. The old man picked the same type every time: full lips, full breasts, jutting buttocks, fiery eyes, heavy hips. Peasant stock.

Krug said, "We're waiting for Senator Fearon, Tom Buckleman, and Dr. Vargas. Thor will take us on the grand tour of the tower. What are you doing afterward, Manuel?"

"I hadn't thought—"

"Go to Duluth. I want you to know something about the plant operations there. Leon, notify Duluth—my son arrives for an inspection trip early this afternoon."

Spaulding went off. Manuel shrugged.

"As you wish, father."

"Time to extend your responsibilities, boy. To develop your management capacities. Some day you be boss of all this, eh? Someday when they say Krug—they will mean you."

"I'll try to live up to the trust you've placed in me," Manuel said.

He knew he wasn't fooling the old man with his glibness. And the old man's show of paternal pride wasn't fooling him. Manuel was aware of his father's intense contempt for him. He could see himself through his father's eyes—a wastrel, a perpetual playboy. Against that he held his own image of himself: sensitive, compassion-

ate, too refined to brawl in the commercial arena. Then he tumbled through that image to another view of Manuel Krug, perhaps more genuine: hollow, earnest, idealistic, futile, incompetent. Which was the real Manuel? He didn't know. He understood less and less about himself as he grew older.

Senator Fearon stepped from the transmat.

Krug said, "Henry, you know my son Manuel—the future Krug of Krug, he is, the heir apparent—"

"It's been many years," Fearon said. "Manuel, how are you?"

Manuel touched the politician's cool palm. He managed an amiable smile.

"We met five years ago in Macao," he said gracefully. "You were passing through, en route to Ulan Bator."

"Of course. Of course. What a splendid memory—Krug, this is a fine boy here."

"You wait," Krug said. "When I step down he'll show you how a real empire-builder operates.

Manuel coughed and looked away, embarrassed. Some compulsive sense of dynastic need forced old Krug to pretend that his only child was a fit heir to the constellation of enterprises he had founded or absorbed. Thus the constant show of concern for Manuel's "training," and thus the abrasive, repetitive public insistence that Manuel would some day succeed to control.

Manuel had no wish to take command of his father's empire. Nor did he see that he was capable of it. He was only now outgrowing his playboy phase, groping his way out of frivolity the way others might grope their way out of atheism. He was looking for a vehicle of purpose, for a vessel to contain his formless ambitions and abilities. Some day, perhaps, he might find one. But he doubted that Krug Enterprises would be that vehicle.

The old man knew that as well as Manuel did. Inwardly he scorned his son's hollowness and sometimes the scorn showed through. Yet he never ceased pretending that he prized his son's judgment, shrewdness, and potential administrative skills. In front of Thor Watchman, in front of Leon Spaulding, in front of anyone who would listen, Krug went on and on about the virtues of the heir apparent. Self-deluding hypocrisy, Manuel thought.

He's trying to hoax himself into believing what he knows damned well won't ever be true. And it won't work. It can't work. He'll always have more real faith in his android friend Thor than he will in his own son. For good reason, too. Why not prefer a gifted android to a worthless child? He made us both, didn't he?

Let him give the companies to Thor Watchman, Manuel thought.

The other members of the party were arriving. Krug shepherded everyone toward the transmat banks.

"To the tower," he cried. "To the tower!"

1110, the tower. He had regained the better part of an hour out of his lost morning, anyway, through this jump of one time-zone westward from New York. But he could have done without the trip. Bad enough to caper in the chill Arctic autumn, forcing himself to admire his father's absurd tower—the Pyramid of Krug, Manuel liked to call it privately—but then there had been the business of the falling block, the crushing of the androids. A nasty incident.

Clissa had gone to the edge of hysteria.

"Don't look," Manuel told her, folding his arms about her as the wallscreen in the control center showed the scene of the lifting of the block from the corpses. To Spaulding he said, "Sedative. Fast."

The ectogene found him a tube of something. Manuel jammed the snout against Clissa's arm and activated it. The drug leaped through her skin in a soft ultrasonic spurt.

"Were they killed?" she asked, head still averted.

"It looks that way. Possibly one survived. The others never knew what hit them."

"The poor people."

"Not people," Leon Spaulding said. "Androids. Only androids."

Clissa lifted her head. "Androids are people!" she blazed. "I don't ever want to hear something like that again! Don't they have names, dreams, personalities—"

"Clissa," Manuel said gently.

"—ambitions?" she said. "Of course they're people. A bunch of *people* just died under that block. How could you, you in particular, make such a remark about—"

"Clissa!" Manuel said, anguished.

Spaulding was rigid, eyes glassy with rage. The ectogene seemed to tremble on the verge of an angry retort but his fierce discipline saw him past the moment.

"I'm sorry," Clissa murmured, looking at the floor. "I didn't mean to get personal, Leon. I—I—oh, God, Manuel, why did any of this have to happen?"

She began to sob again. Manuel signaled for another sedative tube but his father shook his head and came forward, taking her from him.

Krug cradled the girl in his immense arms, half crushing her against his huge chest.

"Easy," he said, hugging her. "Easy, easy, easy. It was a terrible thing, yes. But they didn't suffer. They died clean. Thor will look after the hurt ones. He'll shut off their pain centers and make them feel better. Poor Clissa, poor, poor, poor, poor Clissa—you've never

seen anyone die before, have you? It's awful when it's so sudden, I know. I know." He comforted her tenderly, stroking her long silken hair, patting her, kissing her moist cheeks. Manuel watched in astonishment. He had never seen his father so gentle before in his life.

But of course Clissa was something special to the old man—the instrument of dynastic succession. She was supposed to be the steadying influence that would guide Manuel to an acceptance of his responsibilities and she also was charged with the task of perpetuating the name of Krug. A paradox, there: Krug treated his daughter-in-law as though she were as fragile as an ancient porcelain doll—yet he expected a stream of sons shortly to begin flowing from her loins.

To his guests Krug now said, "Too bad we end the tour this way. But at least we saw everything before it happened. Senator, gentlemen, I'm grateful that you came to see my tower. I trust you come again when it's a little more finished. Now we go, eh?"

Clissa seemed calmer. It troubled Manuel that not he but his father had been the one to soothe her.

Reaching out to take her, he said, "I think Clissa and I will head back to California. A couple of hours together on the beach and she'll be steadier. We—"

"You are expected this afternoon in Duluth," said Krug.

"I—"

"Send for household androids to fetch her," he said. "You go to the plant." Turning away from Manuel, Krug nodded to his departing guests and said to Leon Spaulding, "New York. The Upper office."

1138, the tower. Nearly everyone was gone, now: Krug, Spaulding, Quenelle and Vargas back to New York, Fearon and Buckleman to Geneva, Maledetto to Los Angeles, Thor Watchman down to see about the injured androids. Two of Manuel's household betas had arrived to take Clissa back to Mendocino. Just before she stepped into the transmat with them, Manuel embraced her lightly, kissing her cheek.

"When will you come?" she asked.

"Early this evening, I guess. We have a date in Hong Kong, I think. I'll get back in time to dress for dinner."

"Not sooner?"

"I have Duluth to do. The android plant."

"Get out of it."

"I can't. You heard him tell me to go. Anyway, the old man's right—it's about time I saw it."

"What a bore."

"I have to. Sleep well, Clissa. Wake up with this ugly thing that happened here left far behind. Shall I program an erasure wire for you?"

"You know I hate having my memory tampered with, Manuel."

"Yes. I'm sorry. You'd better go, now."

"I love you," she said.

"I love you," he told her.

He nodded to the androids. They took her arms and led her into the transmat.

HE WAS alone, except for a couple of unknown betas who had arrived to take charge of the control center in Watchman's absence. He walked coolly past them into Watchman's private office at the rear of the dome, pushed the door shut and nudged the input of the telephone. The screen lit up. Manuel tapped out the cell numbers of a scrambler code and the screen responded with the abstract pattern that told him his privacy was guaranteed. Then he punched the number of Lilith Meson, alpha, in the android quarter of Stockholm.

Lilith's image glowed on the screen—an elegantly constructed woman with lustrous blue-black hair, a high-bridged nose, platinum eyes. Her smile dazzled.

"Manuel? Where are you calling from?" she asked.

"The tower. I'm going to be late."

"Very late?"

"Two or three hours."

"I'll shrivel. I'll fade."

"I can't help it, Lilith. His majesty commands me to visit the Duluth android plant. I must go."

"Even though I've rearranged a week's shifts to be with you tonight?"

"I can't tell him that," Manuel said. "Look, it's only a few hours. Will you forgive me?"

"What else can I do? But how dull to have to go sniffing in vats when you could be—"

"It's known as noblesse oblige. Anyway, I've become a little curious about the android facts of life since you and I—since we—Do you know, I've never been inside one of the plants?"

"Never?"

"Never. Wasn't ever interested. Still not interested, except in one special angle of it. This is my chance to find out what sort of things are under that lovely scarlet skin of yours. Here's my chance to see how Krug Synthetics makes Liliths by the batch."

"Are you sure you really want to know?" she asked, dropping her voice into cello range.

"I want to know all there is to know about you," Manuel said earnestly. "For better, for worse. So forgive me for coming late, will you? I'll be taking a Lilith lesson in Duluth. And I love you."

"I love you," said Alpha Lilith Meson to the son of Simeon Krug.

1158, Duluth. The main Earthside plant of Krug Synthetics, Ltd. —there were four others on as many continents and several off-

world plants—occupied a sleek building nearly a kilometer long and flanking the shore of Lake Superior. Within that building, operating virtually as independent provinces, were the laboratories that formed the stations of the way in the creation of synthetic life.

Manuel now toured those stations of the way like a visiting proconsul weighing the work of the underlings. He rode in a plush bubblecar as seductively comfortable as a womb. It glided along a fluid track that ran the length of the building, high above the operations floor. Beside him in the car was the factory's human supervisor, a neat, crisp fortyish man named Nolan Bompensiero, who, although he was one of the key men in the Krug domain, sat tense and rigid, in obvious fear of Manuel's displeasure. He did not suspect how resentful Manuel was of this assignment, how bored he was, how little he cared to brandish power by making trouble for his father's employees. Manuel had only Lilith on his mind.

This is the place where Lilith was born. This is the way Lilith was born.

At each section of the factory an alpha—the section supervisor—entered the car, riding with Manuel and Bompensiero to the end of his own zone of responsibility. Most of the work at the plant was under the direction of alphas. The entire giant installation employed only a half-dozen humans. Each alpha looked as tense as Bompensiero himself. An inspection of the plant by an authentic Krug was evidently an unusual and disturbing event to them.

MANUEL passed first through the rooms where the high-energy nucleotides constituting DNA, the basic building block of life, were synthesized. He gave half-hearted attention to Bompensiero's quick, nervous spiel, tuning in only on an occasional phrase.

"—water, ammonia, methane, hydrogen cyanide and other chemicals we use an electrical discharge to stimulate the formation of complex organic compounds—the addition of phosphorus—

"—a simple process, almost primitive, don't you think? It follows the line of the classic Miller experiment of nineteen fifty-two —medieval science, right down there on the floor—

"—the DNA determines the structure of the proteins in the cell. The typical living cell requires hundreds of proteins, most of them acting as enzymes, biological catalysts—

"—a typical protein is a molecular chain containing about two-hundred amino acid subunits linked together in a specific sequence—

"—the code for each protein is carried by a single gene, which in turn is a particular region on the

linear DNA molecule—all of this of course you must know. Forgive me for restating such elementary material. I only wish to—"

"Of course," Manuel said.

"—and here, in these vats, we make the nucleotides and join them into dinucleotides and string them together to form DNA, the nucleic acid that determines the composition of—"

Lilith, from those vats? Lilith, from that stinking brew of chemicals?

The car drifted smoothly forward. An alpha supervisor departed. Another alpha, bowing stiffly, smiling fixedly, entered.

Bompensiero said, "We design the DNA templates, the blueprints for the life form we wish to create —but then the task is to make the living matter self-replicating, since surely we cannot build an android cell by cell ourselves. We must reach what we call the takeoff stage. But naturally you know that the DNA is not directly involved in protein synthesis, that another nucleic acid acts as an intermediary—RNA, which can be coded to carry the genetic messages laid down in the DNA—

"—four bases or chemical subunits, arranged in varying combinations, form the code—adenine, guanine, uracil, cytosine—

"—in these vats—you can almost imagine the chains forming—the RNA transmits the DNA instructions—protein synthesis is conducted by cellular particles called ribosomes, which are about half protein and half RNA—adenine, guanine, uracil, cytosine—the code for each protein is carried by a single gene and the code, inscribed on messenger-RNA, takes the form of a series of triplets of the four RNA bases—you follow?"

"Yes, certainly," said Manuel, seeing Lilith swimming in the vats.

"As here. Adenine, adenine, cytosine. Cytosine, cytosine, guanine. Uracil, uracil, guanine. AAC, CCG, UUG—it's almost liturgical, isn't it, Mr. Krug? We have sixty-four combinations of RNA bases with which we can specify the twenty amino acids—quite an adequate vocabulary for the purpose! I could chant the whole list for you as we travel this hall. AAA, AAG, AAC, AAU. AGA, AGG, AGC, AGU. Then AGA—"

The alpha who was traveling with them at the moment coughed loudly and clutched his waist, grimacing.

"Yes?" Bompensiero said.

"A sudden spasm," said the alpha. "A digestive difficulty. Pardon me."

Bompensiero returned his attention to Manuel.

"Well, no need to run down all the sequences. And so we put together the proteins, you see, building up living molecules in precisely the way it happens in nature, except

that in nature the process is triggered by the fusion of the sexual gametes, whereas we synthesize the genetic building blocks. We follow the human genetic pattern, naturally, since we want a human-looking end product—but if we wished we could synthesize pigs, toads, horses, Centaurine proteoids, any form of life we chose. We pick our code, we arrange our RNA and presto! The pattern of our final product emerges precisely as desired."

"Of course," said the alpha, "we don't follow the human genetic code in every respect."

Bompensiero nodded eagerly. "My friend here brings up a vital point. In the earliest days of android synthesis your father decided that, for obvious sociological reasons, androids must be instantly identifiable as synthetic creations. Thus we introduce certain mandatory genetic modifications. The red skin, the absence of body hair, the distinctive epidermal texture, are all designed mainly for identification purposes. Then there are the modifications programed for greater bodily efficiency. If we can play the role of gods, why not do it to the best effect?"

"Why not?" Manuel said.

"Away with the appendix, then. Rearrange the bony structure of the back and pelvis to eliminate all the troubles that our faulty construction causes. Sharpen the senses. Program for optimum fat-versus-muscle balance, for physical esthetics, for endurance, for speed, for reflexes. Why make ugly androids? Why make sluggish ones? Why make clumsy ones?"

"Would you say," Manuel asked casually, "that androids are superior to ordinary human beings?"

Bompensiero looked uneasy. He hesitated as if trying to weigh his response for all possible political impacts, not knowing where Manuel might stand on the vexed question of android civil rights.

At length he said, "I think there's no doubt about their physical superiority. We've programed them from the moment of conception to be strong, handsome, healthy. To some extent we've been doing that with humans for the past couple of generations, too, but we don't have the same degree of control or at least we haven't tried to obtain the same degree of control on account of humanistic objections, the opposition of the Witherers and so forth. However, when you consider that androids are sterile, that the intelligence of most of them is quite low, that even the alphas have demonstrated—pardon me, my friend—relatively little creative ability—"

"YES," Manuel said. "Certainly." He pointed toward the distant floor. "What's going on right down there?"

"Those are the replication vats,"

said Bompensiero. "The chains of basic nucleic matter undergo division and extension there. Each vat contains what amounts to a soup of newly conceived zygotes at the takeoff stage, produced by our build-up procedures of protein synthesis instead of by the sexual process of the union of natural gametes. Do I make myself clear?"

"Quite," said Manuel, staring in fascination at the quiescent pink fluid in the great circular tanks. He imagined he could see tiny specks of living matter in them—an illusion, he knew.

Their car rolled silently onward.

"These are the nursery chambers, Bompensiero said, when they had entered the next section and were looking down on rows of shining metal vaults linked by an intricate webwork of pipes. "Essentially, they're artificial wombs, each one enclosing a dozen embryos in a solution of nutrients. We produce alphas, betas and gammas here in Duluth—a full android range. The qualitative differences between the three levels are built into them during the original process of synthesis but we also supply different nutritional values. These are the alpha chambers, just below to our left. To the right are the betas. And the next room, coming up—entirely gammas."

"What's your distribution curve?"

"One alpha to a hundred betas to a thousand gammas. Your father worked out the ratios in the beginning and they've never been altered. The distribution precisely fits human needs."

"My father is a man of great foresight," said Manuel vaguely.

He wondered what the world would have been like today if the Krug cartel had not given it androids. Perhaps not very different. Instead of a small, culturally homogenous human elite served by computers, mechanical robots and hordes of obliging androids there might be a small, culturally homogenous human elite served only by computers and mechanical robots. Either way, twenty-third-century man would be living a life of ease.

Certain determining trends had established themselves in the past few hundred years, long before the first clumsy android had staggered from its vat. Primarily, starting late in the twentieth century, there had been the vast reduction in human population. War and general anarchy had accounted for hundreds of millions of civilians in Asia and Africa; famine had swept those continents and South America and the Near East as well. In the developed nations, social pressures and the advent of foolproof contraception had produced the same effects. A checking of the rate of population growth had been followed, within two generations, by an absolute and cascading decline in actual population.

The erosion and almost total disappearance of the proletariat was one historically unprecedented outcome of this. Since the population decline had been accompanied by the replacement of men by machines in nearly all forms of menial labor and some not so menial, those who had no skills to contribute to the new society were discouraged from reproducing. Unwanted, dispirited, displaced, the uneducated and the ineducable dwindled in number from generation to generation. This Darwinian process was aided, at first subtly, then openly, by well-meaning officials who saw to it that the blessings of contraception were denied to no citizen. By the time the masses were a minority, genetic laws reinforced the trend. Those who had proven themselves unfit might not reproduce at all; those who merely came up to norms might have two children per couple but no more; only those who exceeded norms could add to the world's human stock. In this way population remained stable. In this way the clever inherited the earth.

The reshaping of society was worldwide. The advent of transmat travel had turned the globe into a village and the people of that village spoke the same language—English—and thought the same thoughts. Culturally and genetically they tended toward mongrelization. Quaint pockets of the pure past were maintained here and there as tourist attractions but by the end of the twenty-first century there were few differences in appearance, attitudes or culture among the citizens of Karachi, Cairo, Minneapolis, Athens, Addis Ababa, Rangoon, Peking, Canberra and Novosibirsk. The transmat also made a national boundaries absurd and old concepts of sovereignty melted.

But this colossal social upheaval, bringing with it universal leisure, grace and comfort, had also brought an immense and permanent labor shortage. Computer-directed robots had proved themselves inadequate to many tasks. Robots made excellent street-sweepers and factory workers but they were less useful as valets, baby-sitters, chefs and gardeners. Build better robots, some said; but others dreamed of synthetic humans to look after their needs. The technique did not seem impossible. Ectogenesis—the artificial nurturing of embryos outside the womb, the hatching of babies from stored ova and sperm—had long been a reality, chiefly as a convenience for women who did not wish to have their genes go down to oblivion but who wanted to avoid the risks and burdens of pregnancy. Ectogenes, born of man and woman at one remove, were too thoroughly human in origin to be suitable as tools—but why not carry the process to the next step and manufacture androids?

Krug had done that. He had offered the world synthetic humans —far more versatile than robots— who were longlived, capable, complex in personality and totally subservient to human needs. They looked human (except for the carefully programed differences), they were as intelligent as humans (at least in the uppermost of their three quality levels) and they could be trained in any desired way. But they were purchased, not hired, and by general consent they were regarded by law as property, not persons. They were slaves, in short. Finding robots unsatisfactory as servants, seeing no ready supply of human servants at hand, Krug had invented a new kind of slave. Manuel sometimes thought it might have been simpler to make do with robots. Robots were things that could be thought of as things and treated as things. Androids were things that looked uncomfortably like people and they might not acquiesce in their status of thinghood forever.

THE car glided through room after room of nursery chambers, silent, darkened, empty but for a few android monitors. Each fledgling android spent the first two years of its life sealed in such a chamber, Bompensiero pointed out, and the rooms through which they were passing contained successive batches ranging in age from a few weeks to more than twenty months. In some rooms the chambers were open -squads of beta technicians were preparing them to receive new infusions of takeoff-level zygotes.

"In this room," said Bompensiero many rooms later, "we have a group of matured androids ready to be 'born.' Do you wish to descend to the floor area and observe the decanting at close range?"

Manuel nodded.

Bompensiero touched a switch. Their car rolled serenely off its track and down a ramp. At the bottom they dismounted. Manuel saw an army of gammas clustered around one of the nursery chambers.

"The chamber has been drained of nutrient fluids. For some twenty minutes now the androids within have been breathing air for the first time in their lives. The hatches of the chamber now are being opened. Here, come close, Mr. Krug, come close."

The chamber was uncovered. Manuel peered in.

He saw a dozen full-grown androids, six male, six female, sprawled limply on the metal floor. Their jaws were slack, their eyes were blank, their arms and legs moved feebly. They seemed helpless, vacant, vulnerable.

Lilith, Lilith!

Bompensiero at his elbow whispered, "In the two years between takeoff and decanting the android reaches full physical maturity—a

process that takes humans thirteen to fifteen years. This is another of the genetic modifications introduced by your father in the interests of economy. We produce no infant androids here."

Manuel said, "Didn't I hear somewhere that we turn out a line of android babies to be raised as surrogates by human women who can't—"

"Please," Bompensiero said sharply. "We don't discuss—" He cut himself sort, as if remembering whom he had just reprimanded, and said in a more moderate way, "I know very little about what you mention. We have no such operations in this plant."

Gammas were lifting the dozen newborn androids from the nursery chamber and carrying them to gaping machines that seemed part wheelchair, part suit of armor. The males were lean and muscular, the females high-breasted and slim. But there was something hideous about their mindlessness. Totally passive, utterly soul-empty, the moist, naked androids offered no response as they were sealed one by one into these metallic receptacles. Only their faces remained visible, looking out without expression through transparent visors.

Bompensiero explained, "They don't have the use of their muscles yet. They don't know how to stand, to walk, to do anything. These training devices will stimulate muscular development. A month inside one and an android can handle itself physically. Now, if we return to our car "

"These androids I've just seen," Manuel said. "They're gammas, of course?"

"Alphas."

Manuel was stunned. "But they seemed so so " He faltered. "Moronic."

"They are newly born," said Bompensiero. "Should they come out of the nurseries ready to run computers?"

They returned to the car.

Lilith!

Manuel saw young androids taking their first shambling steps, tumbling and laughing and getting to their feet and doing it better the second time. He visited a classroom where the subject being taught was bowel control. He watched slumbering betas undergoing personality imprints a soul was being etched into each unformed mind. He donned a helmet and listened to a language tape. The education of an android, he was told, lasted one year for a gamma, two for a beta, four for an alpha. The maximum, then, was six years from conception to full adulthood. He had never full appreciated the swiftness of it all before. Somehow the new knowledge made androids seem infinitely less human to him. Suave, authoritative, commanding Thor Watchman was something like nine or

ten years old, Manuel realized. And the lovely Lilith Meson was—what? Seven? Eight?

Manuel felt a sudden powerful urge to escape from this place.

"We have a group of betas just about to leave the factory," said Bompensiero. "They are undergoing their final checkout today, with tests in linguistic precision, coordination, motor response, metabolic adjustment, and so on. Perhaps you would care to inspect them yourself and personally—"

"No," Manuel said. "It's been fascinating. But I've taken up too much of your time already and I have an appointment elsewhere, so I really must—"

Bompensiero did not looked grieved to be rid of him.

"As you wish," he said oblingingly. "But of course, we remain at your service whenever you choose to visit us again and—"

"Where is the transmat cubicle, please?"

2241, Stockholm. Jumping westward to Europe, Manuel lost the rest of the day. Dark, icy evening had descended in Stockholm. The stars were sharp and a sleety wind ruffled the waters of Mälaren. To foil any possibility of his being traced he had jumped to the public transmat cubicle in the lobby of the wondrous old Grand Hotel. Now, shivering outside he walked briskly through the autumnal gloom to another cubicle outside the gray bulk of the Royal Opera, put his thumb to the chargeplate and bought a jump to Stockholm's Baltic side, emerging in the mellow, venerable residential district of Ostermalm. This was the android quarter now. He hurried down Birger Jarlsgaten to the once-splendid nineteenth-century apartment building where Lilith lived. Pausing outside, he looked about carefully, saw that the streets were empty and darted into the building. A robot in the lobby scanned him and asked his purpose in a flat, froglike voice.

"Visiting Lilith Meson, alpha," Manuel said.

The robot raised no objection.

Manuel had his choice of getting to her flat by liftshaft, or by stairs. He took the stairs. Musty smells pursued him and shadows danced alongside him all the way to the fifth floor.

LILITH greeted him in a sumptuous, clinging, floor-length high-spectrum gown. Since it was nothing more than a monomolecular film, it left no contour of her body concealed. She drifted forward, arms outstretched, lips parted, breasts heaving, whispering his name. He reached for her.

He saw her as a speck drifting in a vat.

He saw her as a mass of replicating nucleotides.

He saw her naked and wet and

vacant-eyed, shambling out of her nursery chamber.

He saw her as a thing, manufactured by men.

Thing. Thing. Thing. Thing. Thing. Thing. Thing.

Lilith.

He had known her for five months. They had been lovers for three. Thor Watchman had introduced them. She was on the Krug staff.

Her body pressed close to his. He brought up his hand and cupped one of her breasts. It felt warm and real and firm through the monomolecular gown and, as he drew his thumb across the tip of her nipple, it hardened and rose in excitement. Real. Real.

Thing.

He kissed her. His tongue slipped between her lips. He tasted the taste of chemicals. Adenine, guanine, cytosine, uracil. He smelled the smell of the vats. Thing. Thing. Beautiful thing. Thing in woman's shape. Well named, Lilith. Thing.

She drew away from him and said, "You went to the factory?"

"Yes."

"And you learned more about androids than you wanted to know?"

"What does that mean?"

"When you held me just then I felt a wall coming down between us."

"No, Lilith."

"You see me through different eyes now. You can't help remembering what I really am."

"That is absolutely not true," Manuel said. "I love you, Lilith. What you are is no news to me. And makes no difference at all. I love you. I love you."

"Would you like a drink?" she asked. "A weed? A floater? You're all worked up."

"Nothing," he said. "It's been a long day. I haven't even had lunch yet and I think I've been going for forty hours. Let's just relax, Lilith. No weeds. No floaters." He unsnapped his clothing and she helped him out of it. Then she pirouetted before a doppler—there was a brief rising burst of sound and her gown disappeared. Her skin was light red, except for the dark brown of her nipples. Her breasts were full, her waist was narrow, her hips flared with the impossible promise of fertility. Her beauty was inhumanly flawless. Manuel nibbled his upper lip and fought the dryness in his throat.

She said sadly, "I could feel the change in you the moment you touched me. Your touch is different. There was—fear?—in it. Disgust?"

"No."

"Until tonight I was something exotic to you—but human, like a Bushman would be, an Eskimo. You didn't keep me in a separate category outside the human race. Now you keep telling yourself that you've fallen in love with a mess of

chemicals. You think you may be doing something sick by having an affair with me."

"Lilith, I beg of you to stop it. This is all in your mind."

"Is it?"

"I came here, I kissed you. I told you I loved you. I'm waiting to go to bed with you. Maybe you're projecting some guilts of your own on me when you say—"

"Manuel, what would you have said a year ago about a man who admitted he'd been to bed with an android?"

"Plenty of men I know have been—"

"What would you say about him? What kind of words would you use? What would you think of him?"

"I've never considered such things. They simply haven't concerned me, ever."

"You're evading. Remember, we promised that we wouldn't play any of the little lie-games people play. Yes? You can't deny that at most social levels sex between humans and androids is regarded as a perversion. Maybe the only perversion that's left in the world. Am I right? Will you answer me?"

"ALL right." His eyes met hers. He had never known a woman with eyes that color. Slowly he said, "Most men regard it as, well, cheap, foul, to sleep with androids. I've heard it compared to masturbation. To doing it with a rubber doll. When I heard such remarks, I thought they were ugly, stupid expressions of anti-android prejudice—and I obviously didn't have such attitudes myself or I never could have fallen in love with you." Something in his mind sang mockingly, *Remember the vats! Remember the vats!* His gaze wavered and moved off center—he stared intently at her cheekbone. Grimly he said, "Before the whole universe I swear, Lilith, that I never felt there was anything shameful or dirty about loving an android and I insist that despite what you've claimed to detect in me since my visit to the factory, I don't have any such feelings even now. And to prove it—"

He gathered her to him. His hand swept down her satiny skin from her breasts to her belly to her loins. Her thighs parted and his fingers found her once more as fleeceless as an infant's—and suddenly he trembled at the alien texture he felt there, and found himself unmanned by it, though it had never troubled him before. So smooth. So terribly smooth. He looked down at her, at her bareness. Bare, yes, but not because she had been shaven. She was like a child there. Like—like an android. He saw vats again. He saw moist crimson alphas whose faces were without expression. He told himself sternly that to love an android was no sin. He began to caress her and she responded as a

woman would respond, with lubrication, with little ragged bursts of breath, with a tightening of her thighs against his hand. He kissed her breasts and clutched her to him. It seemed then that the blazing image of his father hovered like a pillar of fire in the air before him. Old devil, old artificer! How clever to design such a product! A product. It walks. It talks. It seduces. It gasps in passion. It grows tumescent in the labia minora, this product. And what am I? A product too, hey? A hodgepodge of chemicals stamped out from much the same sort of blueprint—*mutatis mutandis*, of course. Adenine. Guanine. Cytosine. Uracil. Born in a vat, hatched in a womb where's the difference? We are one flesh. We are different races but we are one flesh.

His desire for her returned in a dizzying surge and he pivoted, topped her, drove himself deep within her. Her heels hammered ecstatically on his calves. The valley of her sex throbbed, clasping him in authentic frenzy. They rocked and climbed and soared.

When it was over, when they had both come down, she said, "That was disgustingly bitchy of me."

"What was?"

"The scene I made. When I was trying to tell you what I thought was in your mind."

"Forget it, Lilith."

"You were right, though. I suppose I was projecting my own misgivings. Maybe I feel guilty about being the mistress of a human. Maybe I want you to think of me as something made of rubber. Somewhere inside me—that's probably how I think of myself."

"No."

"We can't help it. We breathe it in all the time. We're reminded a thousand times a day that we aren't real."

"You're as real as anyone I've ever known. More real than some." More real than Clissa, he did not add. "I've never seen you clutched like this before, Lilith. What's happening?"

"Your factory trip," she said. "Until today I was always sure that you were different. That you hadn't ever spent one second worrying about how or where I was born, or whether there might be something wrong about what we have going. But I was afraid that once you saw the factory, saw the whole process in clinical detail, you might change—and then, when you came in tonight there was something about you, something chilly that I knew hadn't been part of you before—" She shrugged. "Maybe I imagined it. I'm sure I imagined it. You aren't like the others, Manuel. You're a Krug. You're like a king. You don't have to build up your status by putting other people down. You don't divide the world into people and androids. You never did. And a

single peek into the vats couldn't change that."

"Of course it couldn't," he said in the earnest voice in which he did his lying. "Androids are people and people are people and I've never thought otherwise and I never will think otherwise. And you're beautiful. And I love you very much. And anyone who believes that androids are some kind of lesser breed is a vicious madman."

"You support full civic equality for androids?"

"Certainly."

"You mean alpha androids, don't you?" she said mischievously.

"I—well—"

"All androids ought to be equal to humans. But alphas ought to be more equal than others."

"You bitch. Are you playing games again?"

"I'm sticking up for alpha prerogatives. Can't a downtrodden ethnic group establish its own internal class distinctions? Oh, I love you, Manuel. Don't take me seriously all the time."

"I can't help it. I'm not really very clever and I don't know when you're joking." He kissed the tips of her breasts. "I have to go now."

"You just got here!"

"I'm sorry. I really am."

"You came late, we wasted half our time in that dumb argument—stay another hour, Manuel!"

"I have a wife waiting in California," he said. "The real world intervenes from time to time."

"When will I see you again?"

"Soon. Soon. Soon."

"Day after tomorrow?"

"I don't think so. But soon. I'll call first."

He slipped on his clothes. Her words crackled in his mind.

You aren't like the others, Manuel . . . you don't divide the world into people and androids.

Was it true? Could it be true? He had lied to her. He was festering with prejudices and his visit to Duluth had opened a box of poisons in his mind. But perhaps he could transcend such things by an act of will. He wondered if he might have found his vocation tonight. What would they say if the son of Simeon Krug were to embrace the explosive cause of android equality? Manuel the wastrel, the idler, the playboy, transformed into Manuel the crusader? He toyed with the notion. Perhaps. Perhaps. It offered an agreeable opportunity to shake off the stigma of shallowness. A cause, a cause, a cause! A cause at last! Perhaps. Lilith followed him to the door and they kissed again. His hands stroked her sleekness and he closed his eyes. To his dismay, the room of the vats glowed against his lids and Nolan Bompensiero cavorted in his brain, piously explaining how newly decanted androids were taught the art of controlling their anal sphincters.

Manuel pulled free of Lilith, in

pain, "Soon," he said. "I'll call."

He left.

1644, California. He stepped from the transmat cubicle into the slate-floored atrium of his home. The afternoon sun was edging out over the Pacific. Three of his androids came to him, bearing a change of clothes, a freshener tablet, a newspaper.

"Where's Mrs. Krug?" he asked. "Still asleep?"

"By the shore," a beta valet told him.

Manuel changed quickly, took the freshener and went out to the beach. Clissa was wading in the surf. Three long-legged beach birds ran in giddy circles around her and she was calling to them, laughing, clapping her hands. He was almost upon her before she noticed him. After Lilith's voluptuousness she seemed almost wickedly immature—narrow hips, flat boyish buttocks, the breasts of a twelve-year-old. The dark hairy triangle at the base of her belly seemed incongruous, improper.

I take children for my wives and plastic women for my mistresses.

"Clissa?" he called.

She swung about.

"Oh! You scared me!"

"Having some fun in the ocean? Isn't it too cold for you?"

"It's never too cold for me. You know that, Manuel. Did you have a good time at the android plant?"

"It was interesting," he said. "What about you? Feeling better now, I see."

"Better? Was I sick?"

He looked at her strangely. "This morning—when we were at the tower—you were, well, upset—"

"Oh, that! I'd almost forgotten. God, it was terrible, wasn't it? Do you have the time, Manuel?"

"Sixteen-forty-eight, give or take a minute."

"I'd better get dressed soon, then. We've got that early dinner party in Hong Kong."

He admired her ability to slough off traumas.

He said, "Right now it's still morning in Hong Kong. There's no hurry."

"Well, then, do you want to take a swim with me? The water's not as cold as you think. Or—" She paused. "You haven't kissed me hello, yet."

"Hello," he said.

"Hello. I love you."

"I love you," he said. Kissing her was like kissing alabaster. The taste of Lilith was still on his lips. Which is the passionate, vital woman, he wondered, and which the cold, artificial thing? Holding his wife, he felt no sensation at all. He released her. She tugged at his wrist, pulling him with her into the surf. They swam a while and he came out chilled and shivering. At twilight they had cocktails together in the atrium. "You seem so

distant," she told him. "It's all this transmat jumping. It takes more out of you than the doctors know.

For the party that night she wore a unique treasure, a necklace of pear-shaped soot-hued glassy beads. A Krug Enterprises drone probe, cruising 7.5 light-years from Earth, had scooped those driblets of matter from the fringes of the ashen, dying Volker's Star. Krug had given them to her as a wedding present. What other woman wore a necklace made up of chunks of a dark star? But miracles were taken for granted in Clissa's social set. None of their dinner companions appeared to notice the necklace. Manuel and Clissa stayed at the party well past midnight, Hong Kong time, so that when they returned to Mendocino the California morning was already far advanced. Programing eight hours of sleep for themselves, they sealed the bedroom. Manuel had lost track of the sequence of time but he suspected that he had been awake for more than twenty-four consecutive hours.

Sometimes transmat life gets to be too much to cope with . . .

He brought down the curtain on the day.

TO BE CONTINUED

GALAXY BOOKSHELF

(Continued from page 106)

superiority to ordinary mortals, that made it such a tragedy when the dice killed him according to Henry's rules.

There are a lot of interesting things about this book. For one, of course, it does convey a convincing approximation of how a God might be infinitely creative and yet not in direct control of his creation, omnipotent and yet prey to events, omniscient and nevertheless blind to the future.

The expedient that Henry finally comes to, in his desperate effort to rescue himself, is what finally makes this book indistinguishable from most of the fantasy and science fiction being written today. It is a terrifying one—and I doubt if you'll ever hear me so characterizing a piece of fiction again, since I never have before. It's not merely frightening in concept, or descriptive of frightening events, which are things many good stories can be. No, this appalingly thorough and awesomely deft book constitutes an expert attack on things that you and I really suspect may be fragile; sex and death are the least of them, as you ought to find out. For you and me, old friend, this is not a book about such familiar deep-thinks as life, or God, or vengeance. It is a look at the compulsive heart of fantasy, an alien stare into science fiction. ★

(Continued from page 115)

larged room. The floorshow had gone and the entertainers were mixing with the audience.

Their earlier munificence now produced unordered results and two of the most beautiful of the dancers were soon sitting beside them. The goldwater, followed by a cocktail called Mutate Away, which seemed to consist largely of thorium salts, disappeared faster than ever. Conversation thrived.

After a bit, when the females were talking to each other at a high rate, Rampo said to Damals, "I remember you were telling the senator about the quick reactions but—ah—other shortcomings in humanoid robots. I was just wondering if our little friends here could possibly be—"

"Oh, there's a simple way of telling. Just look into their eyes."

"No, don't tell me" said Rampo, "I'd rather not know."

The evening proceeded.

Having omitted to book a room anywhere, they found themselves in their own ship next morning. After a light breakfast they went around to the central block of one of the library skyscrapers. Here Rampo took Damals into the room he had booked for him. He keyed *Psychology; unpublished documents; bibliography* and punched the date of five years previously. The lights faded and the

descriptive list began to appear on the wall screen.

Rampo said, "Well, enjoy yourself—the amenity machine is here and you can order food and drink by the alimentation key under your right hand. I may be some time. I have a hunch to play which may not pan out."

Rampo played his hunch for four and a half days.

Damals spent more than three quarters of that time in his library room and the rest fishing on the riverbank and wandering around the old squares and the art shops. He slept one twenty-eighth of the time only.

In the room he pored avidly over eighteen hundred papers of psychological importance that he had not yet seen, four papers on the effect of Zomonon goldwater and six hundred and twenty-three documents and books on various other subjects.

When Rampo appeared he seemed to be wearing both his usual superficial airs—of shyness and of cockiness—in a rather exaggerated form.

Damals switched off the paper he was viewing—*Some Anomalous Cases of G7139 Mutational Periodic High Speed Disjection*—and the jittering figure on the screen faded out as light came on.

"What have you found?"

"Watch this."

Rampo reset the keyboard.

Once more the room became dark and the screen illuminated itself. On it appeared the note: *Barbarian species: subcivilization: four-limbed: one-headed upright: Galaxy Norosanis 1211, planet 1237951 / A / 276 / D / 111.* This faded to a diminished red-yellow scene, which presented no difficulty, however, to the highly adaptable vision of the two watchers.

When the room lit up again Damals was weak with laughter.

"Yes. Oh, we must see that again when we've settled the immediate question. Really—how is it possible? A planet of clowns—do you realize our money troubles are over? You can copyright that with any of the strips. Such solemn little pinheads too—rather like those wingless birds on Ribil, only more so, slow and solemn and practically expressionless—"

"Well, what do you think?"

"About Tontor? They're exactly like him—you think a hypnotic oblivion treatment and then plant him there?"

"Well, you're speaking like a psychologist. His reactions are almost exactly that speed and his intelligence is if anything above the normal indicated there—but physically a few changes will be necessary. Did you notice the rather peculiar flaps on some of the sense organs? There are a few other changes too, to be made—but nothing, I think, that our surgeons can't handle."

"That'll be the biologists' con-

tribution to the entirely nonbiological solution of Enedee's problem."

"If it works," said Rampo. "I see no reason to suppose it won't but you never know."

"But how did you find it? Did you know something like this existed?"

"Not at all. It was only that I have some conception of the approximate number of possible variations in the general form of intelligent and semi-intelligent creatures. The precise total must be enormous—but it can't be infinite and we didn't need exact resemblance. Tontor can be tailored to suit to some extent. And the number of planets in the universe supporting some sort of subcivilization is about ten thousand times the number of galaxies, which gives a pretty good chance, particularly as a clear majority of them are four-limbed and one-headed. What I did was to set a few thousand electronic selectors on to the index of species characteristics. I had them keyed to almost eight hundred physical and psychological points. They handle several million cards a second, and in three days they'd given me thirty good agreements. I chose the final one by personal inspection. Not bad, eh?"

"In fact you mean that this isn't a solution only for Tontor, but for the whole problem?"

"Yes, if it works. In some cases we may not find the right sort of environment at all but in general we should almost always succeed. Heaven knows it's not ideal—but I believe the mutations can be happy and the parents will prefer that to anything else that can be done"

"I can foresee a large allotment for a nice new department of mutational psycho-anthropology which won't please Ziel, for one," said Damals.

"No, indeed."

"But surely even this one you've found for Tontor is rather precarious. How close is the physical resemblance? I should have thought no amount of surgery could fix the internal organs exactly to duplicate those of the—those things—unless you have been even more successful than I imagine."

"No," said Rampo. "It's not quite as good as that, I'm afraid."

"Then what will happen if he has an accident or something? That scene with the creatures manipulating others with bits of metal—I took it that it was some sort of primitive doctoring. What will the doctors say?"

"Yes, they are doctors in their way," commented Rampo. He smiled suddenly: "And I know what they'll say—"

AND twenty years later, when the unconscious form of Professor Ralph Macandrew, dragged from his smashed car to the Salem Hospital, lay on the operating table, an amazed surgeon answered his colleague's frantic query with exactly the words that Rampo had predicted: "I can't understand it—he must be a mutation—" ★

DISCOVER A LATENT MOSES

(Continued from page 53)

ver and the red spires to black.

Shivering again, he looked around at the landmass, even more menacing in its great tumbling blackness now that he could no longer see it through the Old Man's eyes. Above, the gaunt ebony figures of the alien trees clutched at him with rustling obscenity, lurching and grasping in the keen wind, occasionally shedding a leprous leaf.

He spun the snowboat about to face the snowfields and climbed in, hauling the sail tight as the craft heeled to the wind. He crowded on speed to leave the sinister landscape behind. He would be glad to be in familiar surroundings again.

There was nothing for him here.

AND so, one week later, the small community in the bell tower resumed its corporate existence. There was little change. Jacko still hunted the snowfields, Switch and Cockade looted the ice tunnels. Shrug, however, slowly recovering from being deprived of alcohol, found good reason to fear for the future and commenced construction of a gallery encircling the inside of the spire at a level with the snow outside. He punched holes in the slates of the spire at intervals of the circumference, so that the four members of the group, in an emergency, could command a 360-degree field of fire. Once he had completed this project he planned to take Jacko on a scouting mission to the next village to see if, perhaps, they could bring back some women.

Only the dreamers were gone. Paladin lay roughly buried under the snow beside the main exit and the Old Man rested at peace in the foothills, miles away.

In the times that were to come, there would be no place for dreamers. ★

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